Telephony.

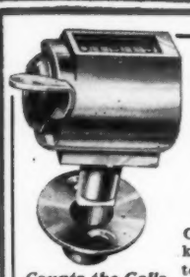
THE AMERICAN TELEPHONE JOURNAL

PUBLISHED EVERY WEEK
BY TELEPHONY PUBLISHING CORP.
608 S. DEARBORN ST., CHICAGO, ILL.

JULY 19, 1924. [VOL. 87. NO. 3.]

Entered as second-class matter Sept. 4, 1903, at the post office at Chicago, Ill., under act of March 3, 1879.

SINGLE COPIES 10 CENTS
YEARLY, U. S. A., $3; CANADA, $4
ALL OTHER COUNTRIES, $5



Keeping count of calls handled daily keeps you informed on traffic tendencies — helps keep ahead of service requirements.

Veeder

Counters, attached to the keyboards, enable you to take periodic counts, give you data for forehanded management and show you the volume handled by each operator.

Counts the Calls

Sets into permanent socket in the keyboard; registers one for each pressure of the thumb lever

Send for Booklet

VEEDER MFG. CO 11 Sargeant St., Hartford, Conn.

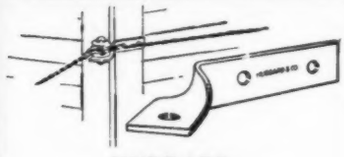
EVERSTICK ANCHORS

lead the world in anchor sales.

WHY?

EVERSTICK Anchor Co.

St. Louis, Mo U. S. A



HUBBARD CORNER BRACKETS

Are used where leads from the pole come to the building at an angle.

Double-Dip Hot Galvanized the Hubbard Way.

HUBBARD & COMPANY
PITTSBURGH - CHICAGO

Telephone Cables

ALL SIZES AND CAPACITIES

Hard Drawn Copper Telephone Wire

AMERICAN ELECTRICAL WORKS

PHILLIPSDALE, R. I.

CHICAGO—812 W. Adams St.
CINCINNATI—Traction Building
NEW YORK—400 East 42nd St.
BOSTON—176 Federal St.

Let Us Tell You

about excess minutes on toll switchboards

The complete story about the checking up of excess minutes on toll switchboards is very interesting—especially to managers. For the sake of helping you get greater efficiency in your time records, we have printed a small, handy booklet. This we send on request.

It tells comprehensively how the Calculagraph stamps on your cards the time of beginning each toll call, together with the **exact time elapsed during each call,** down to the quarter of a minute.

Would you like us to send you a copy?

The Calculagraph Co.
30 Church St. Dept. 16 New York

THE CALCULAGRAPH
THE ELAPSED TIME RECORDER

Remember Back When—

You were always wishing for a device to save skinning and retaping when only a temporary connection was needed?

Then Frankel Testing Clips came to your aid. And now it's simply a matter of fastening the clips so the sharp point pierces the insulation and the connection is made.

Send for booklet

Frankel Connector Co., Inc.
NEW YORK, N. Y.
Western Electric Co., Distributors

American Steel & Wire Co.'s

W & M Telephone Telegraph Wire

Strand—STEEL WIRE

Pole Steps

Descriptive literature — Free

American Steel & Wire Company
Chicago
New York

CEDAR POLES

Treated or Plain
Pentrex a Specialty

NATIONAL POLE CO.
ESCANABA :: :: MICH.
220 Broadway, New York
2844 Summit St., Toledo Ohio
Rialto Bldg, San Francisco

FORT WAYNE PRINTING COMPANY
FORT WAYNE, IND

Printers and Blank Book Manufacturers

Write for Samples and Prices on I. C. C. Forms

Ours Are the Best

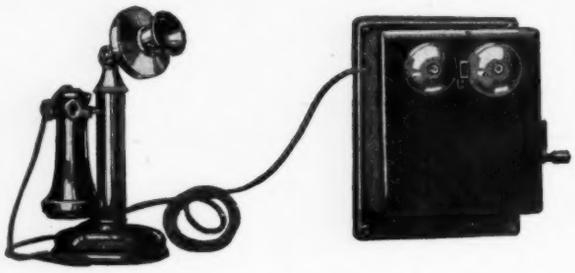
Seasoned Stocks:
Minn. Transfer,
Bellingham, Wash.,
Spokane, Wash.,
Seattle.
British Columbia

CEDAR POLES

Any Butt Treatment

PACIFIC FIR CO.
Seattle, Spokane
Chicago, 19 So. La Salle St.

LEICH DESK TELEPHONE SERVICE



Leich desk telephones can be operated with no greater depreciation or expense except cord replacements than a magneto wall set.

The substantially made stand resists wear and rough handling successfully. The only joint held by a screw is the new transmitter head that fits firmly and tightly in the top of the stem.

Servicing the set is very easy. The bottom plate of the base is removed by unloosening 3 small screws, exposing the cord terminals, induction coil, and hookswitch for change or inspection. Three conductor cords are used on all but the series type sets.

If you have not received a copy of catalog No. 24 write for one today.

LEICH ELECTRIC CO.

Telephones, Switchboards, Accessories

GENOA, ILLINOIS

DISTRIBUTORS

ELECTRIC APPLIANCE COMPANY
Chicago, Dallas, San Francisco, New Orleans

ST. PAUL ELECTRIC CO.
St. Paul, Minn.

POST GLOVER ELECTRIC CO.
Cincinnati, Ohio

TELEPHONE & ELECTRIC SUPPLY CO.
Spokane, Wash.

B-R ELECTRIC COMPANY
Kansas City, Mo.

Better Cores and Armatures

Maximum pull—quick release—make ARMCO Ingot Iron the choice of the world's largest manufacturers of telephone equipment for solid core and armature work.

Unequalled uniformity. Soft, easily worked. We are manufacturers of cold-rolled strips and cold-drawn bars.

Write or phone nearest office for booklet of Electrical Uses of ARMCO Ingot Iron, and prices.

ARMCO Ingot Iron

EDGAR T. WARD'S SONS CO.

Boston Chicago Cleveland Detroit
Newark Philadelphia

"INDIANA"

TELEPHONE AND TELEGRAPH WIRE

PROVEN BEST BY TEST

Time and the aid of America's foremost engineers, have enabled us to develop and manufacture the highest grade wire known to the trade. It is greatest in conductivity and lasting qualities, due to the superior quality of material from which it is made, as well as its *Extra Double Galvanizing*, which insures longest life.

STEEL STRAND

Single and Double Galvanized, Standard, Siemens-Martin, High Strength and Extra High Strength Grades.

HANDLED BY MOST JOBBERS

MANUFACTURED BY

INDIANA STEEL & WIRE CO.

MUNCIE, INDIANA

Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone, Sound Wave
PUBLISHED WEEKLY BY TELEPHONY PUBLISHING CORP.
608 S. Dearborn St. Chicago

H. D. PARGO, President and Treasurer
S. R. EDWARDS, Editor and Secretary

J. R. HASTIE, Vice-President and Advertising Manager
H. D. PARGO, Jr., Western Advertising Manager

Entered as second-class matter September 4, 1908, at the postoffice at Chicago, Ill., under act of March 3, 1879.

Volume 87
Number 3

CHICAGO, SATURDAY, JULY 19, 1924

Subscription—10 Cents a Copy
$3 a Year U. S., Cuba and Mexico
$4 Canada, $5 Other Countries

CURRENT OPINIONS AND COMMENTS

Two notable examples of cooperative readjustment of telephone situations that have recently been made by the Independent and Bell groups are worthy of comment. In this issue is reported the happy result of the negotiations between the Commercial Telephone & Telegraph Co., of Olney, Ill., and the Illinois Bell Telephone Co., whereby the Independent company consolidates its field of operation and now has exclusive control of all exchange and toll service in seven full counties and two half-counties in the southeastern part of the state.

* * * *

The transaction enables both companies to solidify their territory and operate more efficiently and economically. The Commercial company acquires the Bell toll lines in six counties, which gives the Independent system a more compact "tie-up," and also transfers to the Bell certain lines and exchange properties in other sections that can be more logically handled by the Bell company.

This natural division of territory eliminates duplicate toll lines and will mean important advantages to both companies, and to the telephone-using public as well, in improved service. This sort of cooperative effort has received the approval of the public and the state regulatory authorities.

* * * *

The other instance of cooperative readjustment, reported in last week's TELEPHONY, was the sale of the Bell telephone plant at Portsmouth, Ohio, to the locally-owned company, giving it the exclusive field after 25 years of competition.

The Portsmouth Telephone Co. is a pioneer in the business, having started in 1899. Prior to that service was furnished by the Southern Ohio Telephone Co., later the Central Union Telephone Co., which dates back to 1879 when a group of business men bravely launched a telephone system of 50 stations. Today the Portsmouth company operates 11,000 telephones, covering towns and country districts alike, and supplying first class service.

The judgment and decision which ended the duplication in that section of Ohio and left the Independent company in control of the situation are to be commended. The result means economy and better service.

* * * *

There seems to be rather intimate connections between the telephone and national politics in recent years—and not all wire connections, either.

Four years ago the Republicans nominated for President, Warren G. Harding who was long connected with the local telephone company of his home town of Marion, Ohio, and closely idenified with the Independent association of his state.

This year the Democratic presidential candidate is John W. Davis who was the legal counsel for the New York Telephone Co. in its big rate case. When the campaign warms up we are likely to hear considerable about telephone rates, for some of Mr. Davis' opponents in the recent convention raised the objection that he was not available as a candidate because he represented a corporation and was successful in raising the public's telephone bills.

Of course, this line of argument is mere demagoguery. Regardless of partisan politics, and without reference to whether a man is Republican, Democratic, Socialist or what not, the fact that his services as a lawyer were in demand by large business interests for legitimate purposes should not disqualify him for political office. In fact, many sensible people will shrewdly argue that it is a sign of ability which is much needed in government service.

The political demagogues, the radicals and the various other vote-chasers who raise a hue and cry against utility corporations, however, will seek to make political capital out of the case. The Hearst newspapers have already started a campaign trying to arouse the wrath of New York voters because their telephone bills are to be a little higher.

* * * *

Speaking of national candidates, telephone men who attended the convention of the Nebraska Telephone Association, held at Lincoln in 1922, will remember the lively time that ensued when Chas. W. Bryan, who was nominated for vice-president at New York last week, made a speech at one of the sessions. At that time Mr. Bryan was city commissioner of Lincoln and had a bone to pick with the Nebraska State Railway Commission because it had raised utility rates.

He ripped savagely into the commission and the service companies on the rate question and criticized the telephone men for not basing their rates on the ability of subscribers to pay instead of on what constituted a reasonable return on the investment.

Commissioner Thorne A. Browne was present and made a hot reply to Mr. Bryan, defending the rates established and showing that the gross selling price of telephone service in the state was less than 25 per cent more than before the war, although costs were vastly higher. Mr. Browne scored heavily in the argument with Mr. Bryan and was given the decision by the Nebraska telephone men.

* * * *

Good citizenship means more than merely obeying the laws of the land and paying a fair share of the taxes. The good citizen does these things, of course, but he—or she—also goes to the polls on election day and votes to put worthy men in the various offices.

President E. D. Nims, of the Southwestern Bell Telephone Co., feels so strongly on this subect that he has issued an appeal to the employes of his organization urging them to be sure to register so they can vote at the national election. He points out that it is not only a privilege but a duty to vote at every election, and that no one with the right of franchise should neglect to exercise it.

* * * *

This is a good move. The citizen who fails to vote and then kicks about how the government is run has no ground for complaint. Neither has he any right to be counted as a good American. Business men take too little interest in politics until after election, when the radical politicians who have got in begin to threaten industry with hostile legislation.

In fact, failure to vote seems to be a sin that is chargeable against the American people generally. The figures show that since 1896 the percentage of voters who went to the polls on presidential election day has steadily fallen. In 1896, 80 per cent voted; in 1900, 73 per cent; in 1908, 66 per cent; in 1912, 62 per cent, while in 1920 less than 50 per cent cast ballots.

If business executives would give public affairs as earnest attention as they give their private business, great improvement would inevitably follow.

* * * *

Removal of the war tax on telephone toll messages, which became effective July 3, has lightened the burden of service companies materially during the last two weeks, and—what is of equal importance—has meant a money saving to telephone users.

This "nuisance tax" was enacted in November, 1917, but a smaller tax on long distance messages was imposed as far back as 1914, so for nearly ten years the public has been paying a federal tax on tolls.

That this has meant "real money" is shown by the fact that the Interstate Utilities Co., operating 26 exchanges in Idaho, Washington and Montana, reports that in 1923 it paid the government $19,983 as toll taxes. Since 1914, in Idaho alone, the tax amounted to over $96,000.

COMING CONVENTIONS.

Indiana, Indianapolis, Claypool Hotel, September 17 and 18.

U. S. Independent Telephone Association, Chicago, Hotel Sherman, October 21, 22, 23 and 24.

Illinois, Peoria, Jefferson Hotel, November 12 and 13.

Fundamental Toll Traffic Estimates

Prize-Winning Paper in Traffic Division of "Telephony's" Article Contest—Discussion of the Fundamental Estimate of Volume of Toll Business as the Groundwork Upon Which All Other Telephone Traffic Calculations Are Based

By E. W. Hildebrand,

Traffic Engineer, Indiana Bell Telephone Co., Indianapolis, Ind.

That careful plans must be made to carry on the telephone business in a successful manner is quite generally appreciated, but oftentimes more attention is given to the details of the application of a fundamental estimate than is given to the fundamental estimate itself. This, of course, is an obvious fallacy of method which should not prevail. Fundamental estimates should always be given the attention of experienced men.

The details of the application of a fundamental estimate to concrete problems is, of course, an important item in planning, but it should be remembered that they are details which in general can be delegated to less experienced individuals. In general, the detailed estimates of equipment requirements and force requirements are usually figured by applying formulas, based on past experience, to the fundamental estimates. With this principle in mind, it is readily seen that the fundamental estimate comes first in importance since all other estimates depend on it.

The purpose of this article will be confined to a discussion of the fundamental toll traffic estimates, not that local traffic estimates are less important than toll traffic estimates but because, in a sense, a toll traffic estimate is more of an intangible problem and is less clearly understood than the local traffic estimate, and the problem of making the fundamental toll traffic estimate, therefore, demands first attention. Furthermore, the general subject of traffic estimates is too large a one to discuss adequately in one short article.

By the term "Fundamental Toll Traffic Estimates" is meant the estimate of the total volume of offered calls. Fundamental estimates may be classified into three groups depending upon the purpose for which they are intended—seasonal or very short-time estimates, short-time estimates, and long-time estimates.

The "seasonal estimate" is an estimate made of the traffic expected in the next one, two, or three seasons. In general, it is used for determining force requirements, traffic expense estimates, in connection with the budget, or for making very exact position requirement studies at a particular period of the year in determining cut-over or transition plans when cutting over to a new office, or a new line of board, or when making major rearrangements in an existing office, which rearrangements require temporarily cutting down to the fewest possible occupied busy-hour positions.

"Short-time estimates" are for a period of from one to five years in the future, made generally for the purpose of estimating additions or new offices required to handle anticipated business, and for budget purposes.

"Long-time estimates" are made for the purpose of making possible the planning of

equipment layouts and building plans such that an initial installation in a new building will fit in with the ultimate growth for the life of the office and cause the least possible expense in connection with future additions and installations in the building.

Data Required.

The best indication as to the future traffic is a record of past performance. This may be assembled in a number of ways to suit the individual working with the data, as a record of offered calls per month, message per month, offered calls per day, messages per day, or it may be in terms of revenue and may be recorded in tabular form in a data book, or on cards, or graphically or both in a tabular and graphical form.

The record of the average daily offered calls per month is generally a better guide to future development than the record of the total month's business. The record of the total month's business has the advantage of having the least amount of clerical labor involved, and a very easy check is available by comparing the total offered calls with the total month's messages and also with the total month's toll revenue.

The disadvantages of this record are that some months have more Sundays and holidays than others and that all months do not have an equal number of total days. It is obviously not a comparable matter to compare a 30-day month's total business with a 31-day month's total business.

If the record is kept in the form of average daily filed calls, Sunday, holiday and Saturday business is subtracted from the month's total and the remaining business divided by the actual number of business days in the month. Such a record has the advantage of making the record for all months comparable; for instance, the data is comparable whether May is being compared with June of the same year or whether May, of 1924, is being compared with May, of 1923. For the purpose of discussion in the rest of this paper the average daily offered call record will be referred to.

In order to make use of the fundamental toll traffic estimate, various analyses of the character of the traffic will have to be made so that the proper weighting of various calls can be made, with respect to the work involved in handling them. This usually takes the form of an analysis in terms of percentage of particular party and station-to-station traffic; percentage of direct circuit, one switch, etc.

The analysis of toll traffic need not, however, be taken into account when making the fundamental estimate, unless it is anticipated that there will be an appreciable change in character of the traffic in the future from the present, and unless it is anticipated that such a change would affect the volume of traffic.

Practically All of Mr. Hildebrand's Experience in the Telephone Field Has Been in Traffic Work.

In making the seasonal estimate, two or three years' data may be plotted to convenient scale, on cross-section paper, using average daily filed calls as ordinates and months of the year as abscissa.

The same data should also be arranged in tabular form; the first column at the left of the page should list the months, the second column the average daily offered calls in the respective months, and in the third column should be entered percentage figures showing what per cent each month's average daily offered business is of the preceding month. A fourth column may have percentage figures showing what per cent each month's daily offered calls is of some one representative month in the year (January may be chosen arbitrarily, or the maximum month may be chosen and called 100 per cent.)

When this tabular data is assembled and the percentages figured, a projection may be made month by month on the curve by applying the percentage figures just obtained to the last available plotted point of actual data. A projection of expected business for a few months in the future made in this manner is theoretically an exact projection based on actual past experience.

Before accepting the theoretical projection as the one to be used, the judgment of the estimator must be used, for although a seasonal estimate is for a period only a few months in advance, and it might be expected that the trend of the past few months would give an exact indication of the trend of the next few months, this is not always the case, and in some ways the seasonal estimate is the most difficult of all to predict accurately.

It is necessary to take into account any unusual conditions in the past which may have affected the data that has been gathered for the purpose of making the projection, and the present situation must be weighed in a similar manner. It is also necessary to take into account business conditions in the future, as the outlook for a prosperous general business season, or a retrenchment in business will affect the toll business.

If the estimate is being made for a town which is a one or two-industry town, then one must look carefully into the prospects of business for those particular industries, as they will give very valuable indication in determining how high or how low to set the estimate of future requirements.

If the estimate has been made carefully, first, exactly as the past data indicates; second, if it is modified by taking into account the factors mentioned, one can be reasonably sure of a fairly sound prediction and it will be found of great help in estimating force requirements, laying out of student training programs, and in laying out transition plans for a cut-over to a new telephone central office, or the rearrangement of an existing office.

Elmer W. Hildebrand, of Indianapolis, Ind., winner of the first prize in the traffic division, "Telephony's" article contest, has been engaged in traffic work practically all the time since graduation from college.

Starting as assistant engineer with the Central Union Telephone Co. in Chicago in May, 1917, Mr. Hildebrand became assistant traffic chief in the division traffic superintendent's office at Indianapolis in August of that year.

In July the following year he was released for military service, returning in May, 1919, as force requirement engineer, and in August of that year he became acting traffic engineer.

July 1, 1920, Mr. Hildebrand was appointed to his present position of traffic engineer of the Indiana Bell Telephone Co., which had purchased all the property of the Central Union Telephone Co. in Indiana.

Mr. Hildebrand was a member of the committee which worked out and carried on the necessary detail work in connection with the merger of the Indianapolis Telephone Co., with the Indiana Bell Telephone Co. Final consolidation of the Strowger automatic plant of the Indianapolis company with the Western Electric plant of the Indiana Bell company was effected in February, 1922.

In his paper on "Fundamental Toll Traffic Estimates," Mr. Hildebrand has presented information that is accurate and of real value to traffic people.

The short-time forecast made for a period of from one to five years in the future is used mainly for the purpose of estimating central office equipment requirements. This estimate is best made by projecting a curve of the past toll business.

In a similar manner to that described under the heading "Seasonal Forecast," the data may be plotted on graph paper with offered calls as ordinates and years as abscissa. Instead of plotting the average offered calls per month, by months, the average offered calls during the maximum month of the year may be plotted, as this one month's traffic controls the position requirements.

The Short-Time Toll Traffic Estimate.

If the estimate is to be used for any other purpose than determining position requirements, toll traffic for any other month of the year can be determined by applying the percentages which have been determined in the seasonal traffic estimate. Data should be secured for at least five year's past business and, of course, the more year's past data that is available, the more accurate the traffic estimate can be made.

In addition to the plotted curve, this data should be arranged in tabular form, the first column should list the years for which the data is available; the second column should list the busiest month in the year; the third column should list the average daily offered calls in the busiest month; and the fourth column should show percentage items indicating the percentage which each year's business has increased or decreased over the preceding year's business.

An average should then be taken of the algebraic sum of the percentage increases, and this average percentage increase applied to the last year's available data, to obtain an estimate of the next year's business. In a similar manner, the same percentage should be applied to the estimated figure just obtained in order to obtain the next year's estimate. This process may be continued for as many years as it is desired to have the short-time toll traffic estimate cover.

The estimated business for each of the future years may now be plotted as a projection of the curve made of the past actual business and a smooth curve drawn through the estimated points and joined with the curve of the actual past business. It will be found that this projection is not a straight line, but that it has a pronounced up curve. It is exactly the same sort of curve that is obtained when plotting a compound interest curve.

When this curve has been plotted as described, it is well for the estimator to check the reasonableness of the trend by what, for want of a better term, may be called the "rubber band" method; that is, stretch a rubber band along what appears to be the trend of the actual data and note where a line drawn under it would project to in the future. This, of course, is a straight line and will not coincide exactly either with the curve of past business or the projected curve made on the percentage basis, but it should serve as a valuable check for the last point on the projected curve.

As in the case of the seasonal estimate, the estimator should consider well his actual data as to whether any of it is affected by abnormal conditions. He should consider present general business conditions, and future general business prospects; and if the town under consideration does not have a diversified business, he should consider particularly the business prospects of whatever industry or industries control the business welfare of the town. After taking all of these things into consideration, the estimator is ready to make his final estimate and he can rest assured that it is the best estimate he can possibly make.

Long Time Toll Traffic Estimates.

The long-time estimate is made for the purpose of determining the length of life of an office in an existing building or for determining the ultimate sized building required when considering a new building, and a new office installation. A carefully prepared and reasonably accurate long-time estimate will save the telephone company many dollars in the future periods by eliminating unnecessary changes of plans to fit rapidly-growing equipment into an inadequate building, or by eliminating plans for a building entirely too large for the reasonable ultimate requirements.

In making the long-time estimates, the same methods are followed as in making short-time estimates with some additions. The curve of past data should be made in the same way, but the data should cover as many years back as possible. The tabular data is arranged in the same manner and the percentage items obtained in the same way, and the future estimated calls figured from these percentages. The estimated curve is then plotted.

It will now be found that the compounding effect of applying the percentage increase is much more pronounced over a period of, say, 20 years than was noticed on the five years' projection. The reasonableness of the increase at the end of 20 years may be questionable. The straight-line, or rubber-band method of projection would not give any such increase.

A consideration of this fact may well cause one to wonder whether it is reasonable to use the precentage method of determining increases in offered toll business at all. However, one should remember that the offered toll business is in part proportioned to the population available to originate toll business, and that in general population increases a certain percentage each year rather than by a flat rate of so many people per year. It is well then to consider the history of the population growth of a town when making a long-time toll estimate.

If the town is not growing on a percentage basis, then in all probability a straight-line increase of toll is all that will be experienced in future toll business. If the town is a new industrial center, however, a more rapid growth may be expected in the future. If the town has had relatively poor toll service in the past, and better equipment and toll lines will improve this service in the future, it can be expected that the existing population will make freer use of the toll service available in the future.

However, in general, it does not appear as though the percentage increase at the same rate should be used throughout as long a period as 20 years. A check should be made of the last point estimated, by the following method:

Obtain as far back as possible data as to the average daily filed calls and the local stations in all offices, including tributaries, if any, which originate toll calls. These should be tabulated, the year and month in the first column; the stations in the second; the average daily filed calls in the third; and in the fourth column should be entered the day toll calling rate per station obtained by dividing column three by column two.

The toll calling rate thus obtained should be plotted on the same sheet upon which the daily filed calls actual and estimated have been plotted. The calling rate curve can usually be plotted conveniently near the top of the sheet. If the trend of this calling rate curve is neither up nor down, it may be assumed that a calling rate picked from an average of the peak months of each year can be used in connection with a commercial estimate of the local stations expected at the end of the long time period to determine the expected future toll calls. The value of this estimate will, of course, depend upon the accuracy of the estimate of local stations which of course is based on population.

Analysis of Rate Curve.

If the toll calling rate curve shows an upward trend, it indicates that a saturation point has not been reached in the development of toll business. As by far the largest part of the toll calls are business or commercial calls and only a relatively small part are social calls, it follows that a town which is not developed industrially has not reached a toll saturation point if there is any prospect of industrial development.

In certain Eastern cities, which have long been industrial centers, the toll calling rate per station does not show much of a tendency to increase in value, while in other cities of the Middle West or newer parts of the country where indus-

(*Please turn to page* 29.)

Solution to a Competitive Problem

Competitive Situation in Southeastern Illinois Has Been Solved Through Agreement Between Bell and Independent Companies—Commercial Company of Olney Now Operating Exclusively in Seven Full and Two Half Counties

By Hiram D. Fargo, Jr.

The system of the Commercial Telephone & Telegraph Co., of Olney, Ill., is now in an exceptionally strong and healthy condition. As a result of recent purchases and sales it operates in seven full and two half counties in southeastern Illinois without a Bell toll line or a Bell telephone within the territory.

A total of 13 exchanges, with 8,050 subscriber stations, are being operated by the Commercial company, in a territory rich in natural and agricultural resources and one that is developing rapidly as a manufacturing and industrial center. Although prior to the sales and division of properties, the company operated 25 exchanges, it is now serving a few more stations from its reduced total number of exchanges and is in better position to operate the properties efficiently and economically, from the position of both the stockholder and subscriber.

On May 1 the Commercial company purchased the toll lines of the Illinois Bell Telephone Co. in Lawrence, Richland, Clay, Wayne and Crawford counties and a part of Jasper county.

The property of the Citizens Telephone Co. of Lawrence County was purchased on June 1. This company operated plants at Lawrenceville, Bridgeport, Sumner and St. Francisville, with toll lines extending east, west, north and south across the county to the county line, connecting with the Indiana Bell Telephone Co. at the Wabash River near Vincennes, Ind., and the lines of the Commercial company at the south, west and north parts of the county.

These transactions placed the Commercial company in control of all of the toll lines in Richland, Lawrence, Wabash, Edwards, Wayne, Clay and Crawford counties, with toll lines from the north line of White county through Carmi, and from the south line of Jasper county to Newton. In addition to the 13 exchanges it owns and operates, 49 cities and villages within the territory, having Independent telephone exchanges, are dependent upon it for toll and long distance service.

H. H. Knipe, President and Organizer of the Commercial Company of Olney, One of Illinois' Most Progressive Telephone Men.

The Commercial company, under the terms of the agreement with the Illinois Bell as of May 1, sold its toll lines in Hamilton, Saline, Gallatin, Pope, Hardin, Jefferson, Marion, Clinton and St. Clair counties and its exchanges in Marion, Clinton and White counties. To the Illinois Southern Telephone Co. it sold its exchanges at Shawneetown, Ridgeway, Equality and Golconda and to the Rosiclare Telephone Co. the plant operated in Elizabethtown.

This division of territory is of benefit to both the Illinois Bell and Commercial companies, by reason of the elimination of a duplicate toll line system over the entire territory operated by both companies heretofore. Furthermore a natural division of territory has been effected between the wholesale centers of this territory, with good shipping facilities to nearby cities and villages from each wholesale center.

The division of the territories of the two companies is practically in the middle of the state, between St. Louis, Mo., on the west and Vincennes, Terre Haute and Evansville, Ind., on the east.

It is now possible for the Commercial and Illinois Bell companies to develop their toll lines to the respective wholesale centers to the greatest convenience of all subscribers. The cost of operating the various toll lines of these respective companies will also be reduced to a minimum, for as every telephone man knows, a well-organized toll system, without competition, can be operated at less cost than a scattered and duplicated system.

The telephone history in the territory operated by the Commercial company is a record of the activities of the president

Offices of the Commercial Telephone & Telegraph Co. in the Headquarters' Building at Olney, Ill.

Wire Chief's Department Showing Main Frame and Power Equipment—Vice-President Wm. Knipe in the President's Office.

and organizer of the company, H. H. Knipe. The telephone development, he states, began in Crawford county where D. J. Chamblin and sons had commenced operating a few telephones on one line under the name of the Crawford County Mutual Telephone Co. The company's list of subscribers increased steadily and it was later incorporated.

On July 1, 1908, the Crawford County Mutual was the principal company in Crawford county, although there were two other companies, one known as the Citizens' Telephone Co., a farmers' company, and the Southeastern Illinois Long Distance Telephone & Telegraph Co., which was organized to take over the Citizens' Telephone Co.

During the month of June, 1908, Mr. Knipe bought an interest in the Southeastern Illinois Long Distance company, and consolidated the three companies under the name of the Southeastern Illinois Long Distance Telephone & Telegraph Co. That company then took over and purchased interests in the following companies:

June, 1910, the Richland County Telephone Co., of Olney, operating plants and toll lines in Richland county, Illinois, and also in several of the adjoining counties.

Operating Room at the Mt. Carmel Exchange.

June, 1912, the Fairfield Mutual Telephone Co., operating in Fairfield, with toll lines extending from Fairfield to Albion in Edwards county, to Mt. Vernon in Jefferson county, to Mill Shoals in White county, and to the north line of Wayne county.

April, 1913, the Salem Telephone Co., operating a telephone plant in Salem, with toll lines over Marion county, and into adjoining counties.

July, 1913, the Westfall Telephone Co., operating exchanges in Grayville, Crossville, Carmi, and Enfield, with toll lines connecting these points.

October 1, 1913, the Evans Telephone Co., of Clay City, operating the Clay City exchange, with toll lines to Mt. Erie and Sailor Springs.

April, 1913, the Flora Telephone Co., operating a telephone exchange in Flora.

All these plants, or private and controlling interest in the Southeastern Illinois Telephone & Telegraph Co., was purchased by the Commercial Telephone & Telegraph Co., of Olney, as of May 1, 1913.

In January, 1914, the property of the Citizens' Telephone Co., of Clinton county, was purchased, soon after that company had taken over the Peoples' Telephone Co.

Operating Rooms in the Flora and Robinson Exchanges of the Company Which Serve, Respectively, 457 and 1,278 Subscribers.

of Clinton county, then operating exchanges in Carlyle, Beckemeyer, Breese, Aviston, Trenton, Germantown and New Baden, with toll lines between all of these points.

The Mt. Carmel Telephone Co., operating a telephone plant in the city of Mt. Carmel, with toll lines to adjoining plants, was taken over in October, 1915, and in November, the Wayne City telephone plant, operating in the village of Wayne City, was purchased from Ray Smith.

The next acquisition was in October, 1920, when the Kinmundy Telephone Co., of Kinmundy, was purchased from William B. Ross.

In August, 1921, that part of the telephone property owned and operated by the Cumberland Telephone & Telegraph Co. in Illinois was purchased. The property included plants in Mt. Carmel, Grayville, Enfield, Norris City, Shawneetown, Ridgeway, Equality, Elizabethtown and Golconda, together with 411 miles of toll pole lines and about 900 miles of toll circuits.

The Albion Telephone Co., operating a telephone plant in Albion, was purchased and taken over in April, 1923.

The recent acquisition of the toll property of the Illinois Bell Telephone Co. and the exchange and toll property of the Citizens company of Lawrence county, as mentioned previously, brings the history of the Commercial company down to the present time.

The future looks exceedingly promising for the Commercial Telephone & Telegraph Co. for, as already briefly touched upon, it operates in a section of Illinois that is rich in natural and agricultural resources and is developing rapidly in manufacturing.

Practically all of the petroleum produced in Illinois is pumped, and most of it is refined in that section of the state. Coal underlies most of the territory, so far untapped except for surface mines. The finest shale in the world for paving brick underlies a large district and is be-

The Telephone Exchange at Flora, Ill.

ing manufactured. The district produces practically all of the world's crop of "Red Top" seed.

For 30 years it has been the center of apple culture in Illinois, and in late years the increase of high-producing peach orchards has been a great source of wealth. General farming is seen at its best in this section of Illinois and is increasing rapidly.

Few districts in the United States have so well withstood the financial depressions of the past few years and no district has made greater industrial, educational and moral improvement than has the territory in southeastern Illinois served by the Commercial Telephone & Telegraph Co.

The largest exchange of the Commercial company is operated at Mt. Carmel, Wabash county, a thriving town of about 11,000. This exchange serves 1,599 subscribers, and has toll connections with Princeton, Albion and Lawrenceville. Following are some of the industries at Mt. Carmel:

Bernett-Kraft-Kauffman Milling Co., manufacturing flour and by-products and employing 70 men, with a daily output of 2,100 bbls.

Iowa Pearl Button Co., employing 33 men and having a capacity of one ton of buttons weekly.

Marx-Haas Mfg. Co., manufacturing overalls, etc., and employing over 400 men and women.

United Pasteboard Co., which employes 60 men and has a daily capacity of 38 to 40 tons of cardboard and cardboard boxes.

Bluff City Milling Co., manufacturing flour, etc., and employing nine men, with an output of 100 bbls. daily.

Big Four Railroad repair shop, normally employing 600 men.

Lawrenceville, the county seat of Lawrence county, another of the larger exchanges, has 1,258 stations in service. The main industries of that city are:

Indian Oil Refining Co., employing 1,000 men, and having a capacity of 15,000 to 18,000 bbls. daily.

Pioneer Asphalt Co., manufacturing asphalt paving, paints and by-products and employing 100 men.

St. Louis Cooperage Co., manufacturing barrels and employing 30 men.

A. L. Maxwell Auto Supply Co., branches at Robinson and Vincennes, the largest automobile and automobile parts supply company in that section of the state.

Fairfield has about 715 telephones in operation. This town has two important industries in its midst, the Sexton Mfg. Co., manufacturers of underwear, employing 650 men and women, with an average weekly payroll of $10,000, and the Blackburn Poultry & Produce Co., dealers and shippers of poultry and produce, principal offices in Fairfield and Olney and with branches all over the southern part of the state.

Following are the principal industries of the city of Robinson, a city with a population of 3,375 and 1,278 telephones:

Wabash Refinery & Oil Co., employing 100 men, with an output of 1,000 bbls.

The Olney, Mt. Carmel and Lawrenceville Exchange Buildings of the Commercial Telephone & Telegraph Co.

Otey Lumber Co., one of the largest lumber concerns in that section, employing 30 men.

The Warman Pottery Co., manufacturers of bathroom equipment, kitchen sinks, etc., the largest of its kind in the world, employing 200 men, has a $7,000 weekly payroll at the present time, and is arranging a double capacity to begin in the near future.

Olney, the headquarters exchange of the Commercial Telephone & Telegraph Co., serves a city with a population of 4,491, there being 1,037 telephones in operation. In the general offices of the company together with those of the Suttle Equipment Co., 40 men and women are employed.

Following are the industries of Olney and vicinity:

International Shoe Co., employing 1,450 men and women with a weekly payroll of over $7,000.

Sexton Mfg. Co., a branch of the Sexton company at Fairfield.

The Jones Co., manufacturers of gloves, the only manufacturer of its kind in that part of the state, employing from 22 to 45 people, with an average payroll of $2,000 a week.

Olney is also the center of one of the finest fruitbelts in that section of the country. Many carloads of fruit are shipped from that city annually.

Bridgeport is the center of the oil industry of Lawrence county, and its facilities for handling and storage of oil are said to be unsurpassed. The Bridgeport exchange serves 460 stations.

The International Shoe Co., employing 250 men and women with a weekly payroll of $3,000 and the Sexton Mfg. Co., manufacturers of underwear, employing 60 people with a weekly payroll of over $800, are the principal industries of the town of Flora where the company operates an exchange serving 457 stations.

In addition to being a division point of the B. & O. Railroad, Flora is the center of a fine fruitbelt and has excellent storage and shipping facilities.

Albion, a town with 411 telephones, has as its main industries the Albion Shale Brick Co., employing 90 men, and the Albion Brick Co., employing 54 men, the largest manufacturers of brick in southern Illinois. They furnished the material for the paving of 20 miles of hard road in Edwards county.

The other exchanges of the Commercial company with the number of stations operated are as follows: Clay City, 117; Flat Rock, 33; Wayne City, 13; Sumner, 429; and St. Francisville, 243.

The officers of the Commercial company, in addition to President H. H. Knipe are: Vice-President, William Knipe; secretary, R. H. Kile, treasurer, E. E. Gregg.

President Knipe's son, James L. has just completed his second year at Yale where he has made a record as an honor student. He expects to take up the reins of the business as soon as he finishes school and he expresses himself as "enthusiastically interested in the telephone business and the art of maintaining good public relations."

In this latter matter the father, H. H. Knipe, has succeeded exceptionally well. He is a great believer in the necessity of using the local press for obtaining subscriber good will. Moreover, he believes thoroughly that if all subscribers to telephone service understand the problems involved and the expenses necessary to give good service they will not be averse to paying adequate rates.

Soon after the purchase of the exchanges formerly operated by the Citizens Telephone Co. of Lawrenceville County, Mr. Knipe ran an announcement in the local press explaining why it would be necessary to either raise rental charges or to levy the customary toll charges to neighboring exchanges which had up to that time been omitted.

Explanation was also made that in order to meet the demands of an increasing number of subscribers the installation of new and improved switchboard equipment is necessary, involving a large expenditure.

Mr. Knipe is one of the most active and progressive telephone men in the state of Illinois. He has for years been a director of the Illinois Telephone Association and has been prominent in its activities.

The question of financing for the smaller telephone companies has been carefully studied by Mr. Knipe and his recent transactions in purchasing and selling toll and exchange properties indicate that he has formed some definite conclusions on the subject, and welcomed the opportunity to put them into practice.

The Commercial company, under Mr. Knipe's direction, has always endeavored to give its subscribers the best possible service, toll as well as local. It has developed its toll lines to the highest standard, using practically all copper circuits, and care is constantly exercised to maintain these lines up to a high standard.

The toll lines recently taken over from the Illinois Bell and the Citizens company of Lawrence county, Mr. Knipe states, will be brought up to the high standard of the Commercial toll lines as speedily as possible. All iron circuits will be replaced by copper wire, for in that section of the country the smoke and gas from the oil wells, refineries and factories are most destructive to iron wire, the destructive influence of the fumes and gases extending even to the terminal can.

Mr. Knipe is to be complimented upon the telephone situation as it exists at the present time in his territory. TELEPHONY's readers, from time to time, will undoubtedly hear encouraging reports of the steady growth and expansion of his system.

THE MAGNET.

By Miss Anne Barnes.

One afternoon I hurried into a store just before closing time to match a piece of goods. So intent was I upon my mission that I failed to notice the clerks were beginning to cover the counters. I suppose what made me realize the untimely hour of my arrival was the consciousness that I was an object of unfavorable inspection and comment.

But there I was anyway, so I decided it was best to make known my wants as quickly as possible. The goods to be matched had not been purchased in this store or in this town, and the color and texture were difficult to match. I expected to be crisply informed that there was no possible chance of matching my sample, as I felt a battery of indignant eyes scorching my back.

"May I serve you?" a voice so sweetly addressed me that I looked across the counter rather startled, and saw standing there a tired-faced but smiling girl. Before making my wants known, I explained that I did not realize how near closing time it was until after I had entered the store.

She assured me that it did not make one bit of difference, and that she hoped she would be able to find what I wanted. Bolt after bolt of heavy goods were taken down from the shelves, not hurriedly but in the same manner as if I had been a mid-afternoon customer.

Unable to match my sample of goods, she expressed regret so earnestly that I did not consider she might be using a stock expression, although she probably was. Although unsuccessful in matching my goods, I left the store with a very pleasant impression of the service I had received from one real saleslady among a dozen who, perhaps, were salesladies only in name.

While looking at the goods, I had seen a very pretty piece of material. A few days later I returned and purchased it for a dress. Thus, you see how far pleasing service reaches out. It cannot be measured or sold, but should be freely given as a part of every business transaction, because it is often more valuable than merchandise.

Developments in Manual Operation

Recent Improvements in Manual Switchboard Practice — Straightforward Trunking System Developed for Rochester Company — Innovations of New Board—Paper Presented at Convention of New York Up-State Association

By John P. Boylan,

Vice-President and General Manager, Rochester Telephone Corp., Rochester, N.Y.

When we speak of the invention of the telephone, we are inclined to think of the complex and marvelous art as we know it today, rather than the crude, single-pole receiver that Bell gave to the world in 1876. As wonderful and mysterious as was Bell's invention, it would have remained hardly more than a scientific toy but for the essential contribution to the art that soon followed, which placed the telephone on a par commercially with its elder brother, the telegraph.

It was realized from the first that some switching scheme was needed whereby the lines in a given locality or exchange could be connected to each other. The switchboard used by the telegraph companies at that time consisted of brass bars placed at right angles to one another and separately insulated on a wooden frame. Each line was fastened to a bar and by means of metallic pegs inserted at the junctures of the brass bars, any two lines could be connected together.

With comparatively few changes, this type of switchboard was readily adapted to telephone use, and for a long time it held its own against the many switching schemes designed to replace it. Thus, the switchboard, though crude, was developed to a fair degree of dependability before a suitable transmitter was brought out.

As the talking part of the telephone was the receiver alone, it was, of course, necessary for the user to move the instrument alternately from his lips to his ear. This was rather confusing, especially to new subscribers, and in order to aid them in using the telephone correctly, this notice was usually placed near the set: "Don't talk with your ear or listen with your mouth."

With the advent of the carbon transmitter, the business received a great impetus and the peg switchboard was soon found altogether inadequate to take care of the rapidly growing number of subscribers. The first radical change in the peg type switchboard was the replacing of the cross bars with jacks, and the pegs with plugs attached to long cords.

Owing to the fact that the jacks were rather large, and that even more space was occupied by the line drops, the number of lines that could be placed within an operator's reach might be only a very small percentage of the total number of lines in the exchange.

Therefore, operators at that time did not sit at any particular location at the switchboard, but walked back and forth with long cords, putting up and taking down connections from one end of the board to the other. The noise and confusion of a fair-sized central office of those early years are hardly conceivable when we think of our quiet and orderly operating rooms of today.

An editor, commenting on his visit to the Chicago exchange in 1879, said: "The

Vice-President Boylan Believes in Giving Rochester Subscribers the Benefits of the Latest Developments in Manual Telephony.

racket is almost deafening. Boys are rushing madly hither and thither, while others are putting in or taking out pegs from a central framework, as if they were lunatics engaged in a game of fox and geese."

"A perfect bedlam" was how E. J. Hall described his exchange of 12 boy operators in Buffalo at about the same time. From two to six operators were needed to handle each call. In Chicago all calls were received by boys who repeated them through a speaking tube to the operators; while in another city a boy received the calls, wrote them on white marbles and rolled them to the boys at the switchboard.

Everyone was called by name—there being no number system. Even as late as 1880, when New York City boasted 1,500 telephones, names were still in use.

With the ever-increasing number of subscribers, the switchboard and traffic methods were forced to undergo revolutionary changes, and the first of these was the multiple type switchboard, in which all the subscribers' lines are within reach of each operator. This was a decided improvement on the old board, for it enabled each operator to complete her own calls with consequent saving in number of operators and reduction in errors.

About 1896 the central battery system was inaugurated, and this was perhaps a greater change than all of the previous changes combined. This new system made it possible to do away with the wet batteries and the cumbersome magneto generators at the subscribers' stations. It enabled the large line drops to be replaced with tiny lamps; in fact, there was hardly any part of the accepted standard practice that was not affected.

Other important improvements followed in switchboard design and methods, and the art gradually divided into two schools or branches: Those who continued to develop manual equipment, and those who took up the development of automatic, or as it is called today, "machine switching" systems.

Manual switchboards were soon fairly standardized by engineers and manufacturers, and no radical changes took place for several years. Switchboards of 10,000 lines capacity have been the practical limit for some time, and there is little indication that larger single units are ever advisable.

Aside from the limiting factors of the equipment itself, there are economic reasons in regard to the outside distribution of cables that make it desirable to establish more than one central office in a given district when the total number of lines will equal or exceed 10,000. This brings about the necessity for inter-office trunking, of which there are two general methods.

The first is called two-way trunking, and, as the name implies, employs trunks that can be used for handling calls between central offices in either direction. The other method uses one-way trunks which carry traffic in one direction only. As this is the system almost universally used for multi-office trunking, it will be described.

The outgoing ends of the trunks are on jacks just below the subscribers' multiple, and are arranged in a similar way; that is, they repeat in each section so as to be

available to every A operator. Each group of trunks to a given office is designated by the name of the office, and the trunks are designated by numbers which correspond with the numbering at the other, or incoming end.

The incoming end of the trunks terminate on separate positions from the regular subscribers' switchboard. The trunk positions are usually called "B positions," to distinguish them from the "A positions," at which subscribers' lines terminate. The trunks etrminate at the B positions on cords and plugs associated with supervisory lamps, and ringing keys much the same as in a regular local position, except that they are in one row and closer together, as there are from 30 to 40 in a position. They are designated according to the office from which they come, and are numbered the same at both ends.

The B operator's telephone set is not connected in any way with the trunk circuits, but separate lines known as "order wires" are used to pass orders between A and B operators. Each B operator's telephone circuit is permanently connected to an order wire which terminates on push-button keys at the A positions in the other offices of that exchange group.

Assuming an A operator answers a call for a number in another office, she presses the order button designated by the name of the office desired, and this act immediately connects her telephone set with a B operator to whom she passes the number and the name of her own office.

The B operator then knows from which group of trunks to assign, and gives the A operator the number of an idle trunk in that group, at the same time testing the line called for, to determine if it is busy. If not, she inserts the plug and presses the proper ringing key button, the guard lamp going out at the same time.

The A operator in the meantime has connected her subscriber to the outgoing trunk jack assigned to her. When the conversation is finished, and the subscriber hangs up, the supervisory lamp of the answering and calling cords will light, but the guard light at the B position will not be displayed until the connection is taken down at the A end.

Should the number called for test busy, the B operator then inserts the plug of the trunk she has assigned on that call into one of a small group of jacks known as "busy-back jacks." This will cause the supervisory lamp of the calling cord in that trunk to flash, thus notifying the A operator of that condition. If the calling subscriber has not recognized the clicks—and in some cases a tone—and hung up, he is told by the A operator that his called number is busy.

While this trunking method gives speedy operation, it introduces chances for errors that attempts have been made for several years to eliminate or reduce. In nearly all the modifications heretofore proposed, there was usually a compromise between speed and accuracy; in other words, these schemes, while reducing the possibilities of errors, increased the holding time considerably, as compared with this older method.

Recently a trunking system has been developed by the engineers of the Stromberg-Carlson Telephone Mfg. Co. and the Rochester Telephone Corp., which approaches the desired requirements as to load possibilities and accuracy. This system is a modification of the straightforward trunking method which has taken various forms and is replacing the older order-wire system in different parts of the country.

Incoming Straightforward Trunking Position at Glenwood Exchange, Rochester, N. Y.

The outstanding features of the straightforward method in any of its modifications, as compared with the other system, are that the A operator selects her own trunk and talks directly to the B operator on the trunk used for the subscriber's connection. This gives the two operators an exclusive circuit without interference by other operators.

The first method tried out, while tending to reduce errors, was rather slow and cumbersome. It is known as "Stage 1" and called for only slight changes in the equipment, the principal change being in the method of operation. Two listening jacks are provided at each B position, and wired to the B operator's telephone set.

The A operator receiving a call for another office, plugs into an idle outgoing trunk jack which causes the guard lamp to light at a B position in the office selected. The B operator takes up the plug of the trunk and inserts it in one of the listening jacks, which puts her set across the trunks, at the same time sending back a momentary order tone to the A operator, which is a notification for her to pass her number.

After acknowledging with "right," the B operator removes the plug from the listening jack and tests the jack of the line called. If it is busy, she disposes of the plug in a busy-back jack, the operation of which is the same as in the call-wire method. If the line is not busy, she inserts plug and rings in the regular way.

The disconnect signals operate in the same way and order as they do in the other method. Incoming calls and disconnect signals are both indicated by the guard lamp burning steady, the operator distinguishing one from the other by noting whether the corresponding cord is up in the multiple or not.

To reduce the amount of testing for idle trucks by the A operator, the outgoing trunk multiple jacks are divided into groups and marked to indicate the jack each operator is to start testing.

The disadvantages of "Stage 1" are that it is quite slow and introduces complexities not met with in the call-wire method; for instance, some means must be provided to keep the busy test on an outgoing trunk jack after the A operator has disconnected, since she gives the disconnect signal to the B operator, and the trunk is, therefore, always up for a while after the outgoing end has been released.

It is rather expensive to provide a busy test on the outgoing trunk jacks that can be controlled by the position of the plugs at the incoming end. Hence this is rarely ever done, it being considered that the time lost and inconvenience to the traffic by an operator occasionally plugging into a trunk that has not been taken down by the B operator, hardly warrants the cost of this special feature.

This is also true of a trunk in a busy-back jack, although the lost time is not so long, since an A operator plugging into a trunk still up in a busy-back jack will get the characteristic sound and will go on to the next jack. The principal objection to this stage, however, is its rather small load possibility. In order to bring up this factor and overcome certain other traffic irregularities, some changes were made in the equipment and circuit. This modification was known as "Stage 3," and differs from the other stages in that the B operator's telephone set is automatically cut-in on a trunk, and the signals are now readily distinguished, all tending to make for quicker operation.

The testing time at the outgoing trunk multiple is also cut down by the provision of what is known as "master busy-test feature." The group of jacks that each operator is supposed to test first are so arranged that when all the jacks in that group are busy, a special tone is put on the first jack, so that an operator testing this jack will know that the next five or ten trunks, as the case may be, are busy and will go to the next group.

This stage provides against an A opera-

tor taking a trunk remaining in a subscriber's multiple jack, or a busy jack at the B board, by maintaining a busy test at the outgoing end until the trunk is actually taken down by the B operator.

Busy lines are indicated to the A operators by means of busy-back jacks, the same as in the previous methods. Incoming trunk calls are displayed by the guard lamp burning steadily, and are automatically cut-in on the B operator's telephone set, one at a time, in a definite order, though this may not be always in the sequence that the calls come in. The guard lamp flashes while the trunk is connected to the operator's telephone set, indicating to her which one to pick up.

This was the status of straightforward trunking at the time we decided to take it up for study and further development with the Stromberg-Carlson Telephone Mfg. Co. in the fall of 1923. The subsequent development described represents the work of engineers of the Rochester Telephone Corp. and the Stromberg-Carlson Telephone Mfg. Co.

The first few weeks were devoted to collecting what data on the subject were obtainable, and setting up experimental apparatus in the laboratory. The final laboratory set-up consisted of the equivalent of a B position equipped with 20 automatic cut-in trunks and the corresponding outgoing jacks.

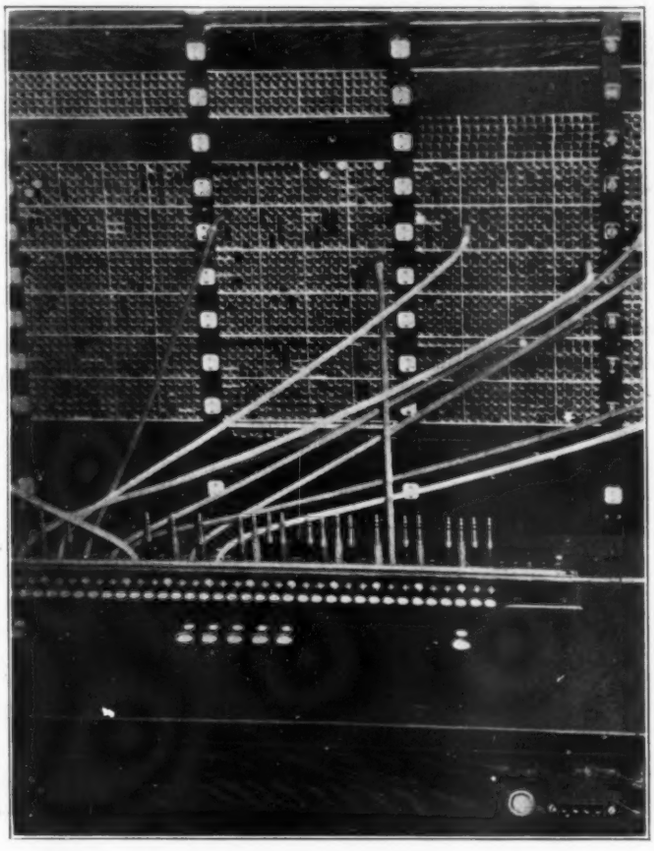
The rapidity and accuracy with which calls could be handled was easily demonstrated by this experimental layout. There are, however, certain objections to the automatic cut-in feature, from equipment and operating viewpoints, which may be summarized as follows:

1. The automatic cut-in apparatus is common to all the trunks in the position, to a more or less degree; so that any trouble occurring with this part of the system is liable to affect, and probably put out of order, a small or large group of trunks depending upon the nature of the trouble.

2. Since the incoming calls are cut in on the B operator's telephone set in a fixed order, such as from left to right; and since the order in which the calls come in cannot be regulated accordingly, it is evident that during the light-load period some of the calls will be held up by the others coming in the proper rotation to be answered first.

3. Considerably more equipment is required to provide this feature, which adds to the complexity of the system, as well as to the cost and maintenance.

With a view to simplifying the trunk circuit and overcoming the objections of the automatic cut-in feature, it was suggested that the cutting-in of the operator's telephone set be controlled by the operator, by means of a small push-button key which is associated with each trunk.



Close-up of Incoming Straightforward Trunking Position Showing Operator's Cut-in Button Associated with Each Trunk. In Center of Keyboard Are Shown Five Ringing Buttons (Four for Each Ringing Frequency and One for P. B. X. Trunks, Etc.), Common to All Cord Circuits on an Operator's Position. Buttons on Ends of Keyboard Are Used for Connecting Busy Back Signal to Any Trunk on the Position.

The trunk circuit was accordingly redesigned to operate on this basis, and it seemed sufficiently promising to warrant a trial in actual practice. A "B" position in our Glenwood office was, therefore, equipped with 40 of the new trunks. During the period of installation, changes of more or less importance were made, so that when the trunks were cut into service a few weeks later, the method of operation was briefly as follows:

A group of 40 trunks from the Main office was chosen for the trial. The outgoing trunk jacks of this group in the Main office were especially marked to distribute the load among the 60 A operators as evenly as possible, and at the same time reduce the amount of testing. No master busy-test feature was provided, since it was felt that the group was hardly large enough to warrant it.

On receiving a call for a Glenwood subscriber, the Main operator tests the first jack of her preferential group. If it is not busy, she inserts her plug, which starts the guard lamp of that trunk flashing. The B operator, noticing the flashing guard lamp, presses the cut-in button directly in front of the guard lamp, which puts her set across the trunk, sends back a momentary order tone, and changes the flashing lamp to steady dim.

The A operator, hearing the tone, passes her number, which the B operator acknowledges by saying "Right," and at the same time picking up the plug of the trunk and testing jack of the line called. It it is disengaged, she makes the connection and presses one of her master ringing buttons corresponding to the party designation called. This releases her set from the trunk, starts the ringing and extinguishes the guard lamp.

During the ringing intervals, a reverting tone is sent back, indicating to the calling subscriber that his party is being rung. The ringing feature used with this system is radically different from the usual arrangement in which each trunk is equipped with a set of four-party ringing keys, since the equivalent of only one such set of keys is provided for the entire group of trunks in each position. A fifth key releases the operator's set on calls requiring no ringing, such as lines to intercepting desks, supervisors, etc.

The set of five keys is centrally located in the keyshelf and at right angles to the conventional arrangement of ringing keys. This is one of the principal features of this system. It was developed by the engineers of the Stromberg-Carlson Telephone Mfg. Co. a few years ago, in connection with their superservice switchboard, and with slight modifications in this ringing scheme, fitted in admirably with straightforward trunking. This feature, perhaps more than any other, makes possible the speed and greater accuracy of Stage 3, using the automatic cut-in.

The trunk holding time was further reduced and the operation simplified, by making the trunk immediately available, upon the A operator taking down the connection, regardless of whether the B operator has pulled down the trunk or not. In either case, if the trunk is again taken, the guard lamp will start flashing.

Main Office, Keystone Telephone Company, Philadelphia, Pa.

Keystone

"The Keystone was the first Teleph ny t
matic system in a metropolitan area ern

The good judgment and foresight ors i
tion the old manual system and ado st e
of telephonic transmission has bee by t
and economical operation of the ne

That the efficiency of the automa ne,
and comparative freedom from error ed b
of Philadelphia is evidenced by the r of
installed during the year and by th tra

Extract from 1923 of

In May 1921, the six Ph ex
stone Telephone Company w rte
matic operation.

Since that time, the ea itio
has shown a marked and cont pro

Each year has seen gre n t
scribers, substantially increa e, a
the cost of operation per sta e t
companying table showing t rat
past three years.

The experience of the Te
typical of that of other co pera
matic equipment. The ado ow
ment invariably spells contin s a

Automatic El c

FACTORY AND GENERAL : C

ASSOCIAT NIE

International Telephone Sales and Engineering C
International Automatic Telephone Company, Ltd.
Automatic Telephone Mfg. Co., Ltd.
Compagnie Francaise pour l'Exploitation des Proc ston
Automatic Telephones, Ltd.

luccess and the Strowger Automatic Telephone System

ny to install a complete auto-
ern part of the country.

rs in discarding at one opera-
st efficient automatic method
y the increasingly successful

e, its greater speed, secrecy,
ed by the business community
of private branch exchanges
traffic."
of Keystone Telephone Company.

exchanges of the Key-
rted to Strowger Auto-

ition of that company
provement.

n the number of sub-
e, and greater savings in
e the figures in the ac-
rative earnings for the

Telephone Company is
erating Strowger Auto-
owger Automatic equip-
s and prosperity.

Company

: CHICAGO, ILLINOIS

NIES

New York
London
Liverpool
Paris
Sydney

COMPARATIVE STATEMENTS OF EARNINGS

	1921	1922	1923
Gross Earnings	$1,739,043	$1,703,274	$1,814,371
Operating Expenses and Taxes	1,106,106	977,681	984,599
Net Earnings	$ 632,939	$ 725,593	$ 829,772
Interest Charges	475,809	501,235	516,999
Balance Available for Dividends, Surplus and Reserve	$ 157,128	$ 224,358	$ 312,773

If the trunk is in a jack, the B operator must pull it down before she can cut in on it.

Busy-Back Jack Unnecessary.

A special busy test for the outgoing trunk multiple controlled from the incoming end is, therefore, unnecessary in this system. At first, busy-back jacks were used to notify the A operator that lines called for were busy, but after this method had been in use a short time, it was observed that occasionally an A operator would plug into a trunk that had just been released by another A operator on a busy-back signal, but which had not yet been removed from the busy-back jack by the B operator.

The A operator getting the busy-back signal would, of course, pull out and go to the next jack. This necessarily slowed down the A operator and increased the trunk holding time.

In call-wire operation, busy-back jacks are necessary, as the B operator must then have an indication of the trunks that are giving busy-back signals, so that she will not assign them until they are released by the A operator. With straightforward operation, however, this is unnecessary, since the B operator in this case does not assign trunks.

This enabled a departure to be made in the usual busy-back jack scheme that greatly simplifies this part of the operation, and overcomes the possibility of an A operator taking up a trunk on which there is a busy-back signal. This was accomplished by substituting a common busy-back key for jacks, and arranging the circuit so that as soon as the A operator removes her plug from a trunk on which there is a busy-back signal, the circuit will be normally restored and available for another call.

After the B operator presses one of the busy-back keys, there being one located at either end of the keyshelf, her set is released from the trunk, the guard lamp is extinguished, and she has to give it no further attention.

Provision of a Splitting Feature.

The next important step was the provision of a splitting feature to prevent traffic collision and give the called subscriber's line immediate disconnect and line lamp recall upon the A operator taking down the connection. If an A operator, therefore, takes a trunk that has not been removed from a subscriber's line, she will not find a party waiting to get his operator, as frequently occurred before this feature was provided.

An emergency listening jack, and a few releasing jacks, are provided for each B operator's position, so that if she is unable to cut in on a trunk in the regular way she can plug into the emergency listening jack and learn the number desired. Should she have difficulty in obtaining a number, or for any other reason she wants to temporarily dispose of that trunk, she does so by plugging it into one of the releasing jacks.

The traffic study shows that there is a marked improvement in the calls handled by this system, the errors being reduced at least 50 per cent, with the operator's load maintained as high as with the order-wire method. The trunk efficiency is also increased by at least 10 per cent, which is a considerable item, especially in congested trunk groups.

As stated before, the outgoing trunk multiple of this experimental group was not changed as far as the equipment was concerned. The jack marking minimized the testing sufficiently to make any further changes unnecessary. For larger trunk groups, however, means, in addition to preferential jack marking, must be provided to cut down the testing time. The simplest scheme is the master busy test described under Stage 3.

A visual master busy signal, while adding some complication to the system, would seem to provide the most desirable arrangement from a traffic viewpoint, especially for the larger trunk groups. Since less than 50 per cent of the outgoing trunk multiple jacks used in call-wire operation is required in straightforward trunking, a substantial saving is made in this portion of the equipment, and incidentally sufficient space is thus provided for master visual signals when required.

This part of the problem is still a matter of discussion among traffic and equipment engineers, and just what the ultimate scheme for the outgoing trunk multiple will be is difficult to predict at this time.

A new switchboard is now being built by the Stromberg-Carlson Telephone Mfg. Co. for our new Culver exchange, to be located in the northeast section of the city. It is expected that this exchange will be cut into service about February 1 next.

The switchboard will be the last word in manual improvements and innovations, and will embrace all of the superservice features, as well as the straightforward trunking system.

The superservice features such as already described on the B keyboard in connection with straightforward trunking, include the absence of ringing and listening keys, the automatic connection of an answering cord to the A operator's set when such cord is placed in the answering jack and the automatic disconnection of the operator's set as soon as the ringing selection is made, automatic ringing, automatic busy signal, both on local and trunked calls, operator's secret service and many others which the time allotted to me will not permit of describing in this paper.

A distinctive feature on this board will be an arrangement whereby the operators can use low chairs without the necessity of providing a platform in front of the switchboard.

The keyboard will be placed 30 inches from the floor, or about the height of an ordinary desk. This enables the operators to use low chairs with their feet on the floor, and to dispense with the usual foot rail.

The usual keyboard height for a board of this size is approximately 40 inches, and in some cases platforms have been provided to reduce this height. In this board, owing to the removal of all apparatus to the terminal room, the only requirement for a greater height than 30 inches was the space allowance for the cords and cord weights.

Space Allowance for Cords.

This space will be obtained by placing a trough approximately ten inches deep in the floor of the operating room at a point immediately below the cords, and arranged to allow the cord weights to extend into it.

This trough extends below the floor for the length of the operating room, and is arranged for the ultimate length of the board. The trough is covered by a removable two-inch oak cover over the portions not in use, and the linoleum floor covering laid over it. On making additions to the switchboard, the trough will be available by removing the cover and linoleum.

This arrangement allows the keyboard to be kept at a convenient level, without the use of platforms or similar means, and enables the operating room floor level to be established when the building is constructed.

The fire risk in a board of this type is reduced to a very low point by placing the relays and structural apparatus in the terminal room, and this risk is further minimized by a system of fire screens and bulk heads. The multiple shelf is extended from the front of the board to the rear panels, the rear portion of this shelf consisting of removable screens.

These screens, which are normally in place, are arranged to be readily removed when necessary to work on the board. The board is further separated by sheet iron bulkheads placed every two sections, and are arranged to allow the installation of the entire multiple and trunk capacity, the space required being closed by removable panels.

The net effect of these screens and bulkheads is not only to confine the fire to the section in which it may originate, but also to prevent any fire that should start from reaching the multiple cables.

It is our plan to extend the straightforward trunking system and the superservice features to every central office switchboard in the city. Our new Culver exchange will be the first entirely new exchange which the Rochester Telephone Corp. will construct, and the efforts of all of the operating and manufacturing staffs will combine to make this exchange a model of efficiency.

Sundry Snapshots Along the Trail

Observations and Comments, Pertinent and Otherwise, On the Sunshine and Shadows of Telephone Work

By Well Clay

We cannot pierce the veil which hides
From mortal sight our future fate,
But we can trust and not repine;
Content to live, to work and wait.

What is to be the future of anything is hard to tell; no one can say, of course, with certainty. Even if one did, who would believe him? How many believed Noah? Very few, and they were his own family and had to follow instructions and await developments whether they really believed the patriarch or not.

Why is it that one finds it so much easier to scoff and disbelieve than to have blind faith? For the same reason, perhaps, that one finds it much easier to slide downhill than to struggle back to the top. Only by the slow and laborious process of experience can one gain real, useful knowledge. Whether in trades, professions or mere occupations, it makes no difference.

The one sure thing we can tell about tomorrow is that it will be different than today, a little, maybe, but not the same: also that we will be called upon to struggle against some thing which confronts us It may be little or big. It may be merely the question of trying to find time to go golfing or it may be more serious, perhaps tragic, to us.

Even the ocean, old as it is, is not settled down to perpetual calm. Therefore, bewail not the lot which keeps you hustling to keep even with the world, the constant struggle to keep your plant in shape and service fit.

If it wasn't for hot water, where would we get our steam? You must have the fires of necessity urging you on or else you would relapse into a sloth in a short time —and you know it. The hope of better things lights the fires of energy and you keep going. That is what will ultimately make a better world.

"When You Have Weeded Out the Troubles and Cultivated the Good Plants . . . You Will Be Proud of Your Garden; and the Fruits of That Garden Will Be Good Service."

If the grain of sand on the seashore did not shift occasionally, there would be no advance in progress and the world would die. Dead worlds are as valueless as dead lines on the switchboard or dead minds among the staff.

"To him who hath (energy, judgment and hope) shall be given (advancement), but to him who hath not (these things) shall be taken away, even that which he hath."

Do you get the meaning now? It's true! How you sometimes bewail the necessity of hiking out along the lines or driving a rattle-te-bang flivver all over the country all day—week in and week out—just to keep the service going right.

We all do, but at times when we find out that a life has been saved through our efforts in keeping things in good trim, we feel better and begin to glimpse something of why we are here.

To keep going according to the dictates of our judgment or that of others is one great law we cannot violate. Therefore, at this season of the year let us be glad we can keep going; that we have a job and a purpose; that we can work and forget our little troubles. Work is the great antidote for disappointment and discontent.

Liken your plant work to a garden and the daily troubles to weeds, and when you have weeded out the troubles and cultivated the good plants—like courtesy, cheerfulness, helpfulness, promptness, and a long list of beautiful plants of like nature—you will be proud of your garden; and the fruits of that garden will be good service.

Eradicate the foul slugs and cut worms of envy, sloth, jealousy, bitterness and their train of kindred and allow the good fruits to grow and flourish — and your garden will be a show place for the world to come and see. Which is the most valuable to the world—a fine and fruitful garden or a backyard of weeds and rubbish?

Your place and your job are easy to determine, and how well you cover them will be reflected in the telephone service in your exchange. How good the service is will determine your status in the town—at your bank, among your friends.

Of course, there may be many things which go towards the making of a first-class exchange which you may not be able to furnish the patrons, for reasons beyond your control. Your directors may not see the situation in the same light you do and

"But at Times When We Find Out That a Life Has Been Saved Through Our Efforts in Keeping Things in Good Trim, We Feel Better and Begin to Glimpse Something of What We Are Here For."

then, again, the patrons themselves may not deem it necessary to pay the rate required to enable you give good service.

Still the reflection will be there to a large extent anyhow, and if it dims the lustre which you feel should be yours, you must console yourself with the knowledge that reputations are builded upon accomplishments—deeds, not intentions. Where good intentions are will be fruitful soil to plant endeavor, but the intentions will require a lot of work as supporting evidence before being accepted at face value.

It is easy to tell how to succeed, but hard to turn the trick. Logical thinking, prompt and vigorous acting and sustained effort along any chosen line will bring success and wealth, but that sustained action is often the missing triplet of the set. It is easy to run a rod but hard to stay a mile. That is the reason why, in the game of business, there are so few who go under the wire at the end of the race.

APHORISM: Only the used hoe remains bright.

Lehigh Company Takes Over Properties in Eight Counties.

The newly-organized Lehigh Telephone Co. has taken over the properties of the Consolidated, Honesdale and Bethlehem telephone companies operating in Lehigh, Northampton, Monroe, Carbon, Berks, Schuylkill, Luzerne and Lackawanna counties in Pennsylvania.

Small Office Problems and Duties

Responsibilities and Duties of the Operators in a Small Exchange—To Be Successful Operator Must Master Her Temper—Service the Watchword—Paper Presented at Operators' Conference at the South Dakota Convention

By Mrs. L. H. Snyder,

Chief Operator, Aurora County Telephone Co., White Lake, S. D.

Telephone service is of great importance to every community large or small; next to mail service, it is the most important in the country. Business men everywhere depend to a very large extent on the telephone to help them carry on their business.

In every line of endeavor, people are beginning to realize the value of giving service. The public demands service—and it is a poor business man who does not recognize the necessity of giving service. Those of us who are engaged in selling telephone service should have a full realization of our responsibilities. Service should be our watchword. It is the only thing we have to sell. The first thing to do when taking a student operator into training is to impress on her that the only thing this company has to sell is "Service."

A great portion of the public to whom we sell telephone service seem to think telephone operators have no problems confronting them and no responsibilities. We can assure them that we have, and in this, all you operators will agree with me. Many people think we are mere machines. I will ask you to pardon me for mentioning this, a little personal experience which happened in White Lake to me. It will explain this point of operators as machines considered by some of our subscribers.

I was very busy one morning when an alarm came in over the rural line about a large prairie fire burning over about two sections. The wind was blowing toward the town. The farmers were wild. The townspeople soon got the same way. It looked like a hopeless case. Everyone thought sure the fire would get into the city and in doing this would take many farm homes on its way.

The manager had gone to help fight the fire with the rest of the able men of the city. The operator was left to fight calls and questions. In all the fuss, one subscriber—there is usually one who can't be happy unless bothering Central—called and called for nothing, only taking the operator's time when it could have been used for better service.

When all was over, the fire out, and things calmed down this subscriber called Central and said: "You know, Central, I am sorry I bothered you so, but really I just think of you up there as a mere machine."

It is needless to say we forgave her, poor thing. It is true many of our movements are mechanical, but, nevertheless, we are human and very much so.

Our sister operators in the larger offices treat us sometimes very indifferently and not as their equal, when in fact we are all just humans, working for one big cause, "Service," and should treat one another with kindness and courtesy. Courtesy and kind consideration are as desirable in telephone talk as in face-to-face conversation.

Your voice over the telephone wire is a projection of your personality. A person

Mrs. Snyder Believes Service Should Be Watchword in Telephone Field.

may be judged, and very wisely so, by her or his manners over the telephone. A pleasing telephone personality is a personal asset, whether talking to another operator or to the subscriber, and it helps to improve the service.

The trials of an operator in a small office are much more than in a large office for these reasons.

We have to keep our offices neat and clean and orderly, for very few small offices have a janitor, and have our fires to watch in the winter for the same reason. When we enter our office early in the morning, we have to take the responsibilities of long distance, local and rural operator and general information bureau.

The chief aim of the telephone company is to see that its operators give courteous, accurate and prompt service, handle each call in such a way that the subscribers will know that they know their business. We must also work with beginners so that they will understand the work and make it appeal to them.

We must know how to handle complaints and how to test lines. Often the toll wire chief is testing the line and needs our assistance when the manager is out. If we could not help in this way the toll service would be held up.

We are also responsible for the commercial, plant and traffic, and there are times when those in charge of these departments are away from the office. We must be very courteous to the patrons we serve at the switchboard, because we have to go out and collect accounts from them, and a great many of them come to the office to pay.

We handle our long distance on the same board and always at the same time. When the toll is ringing loudest, local is busiest, and to top all our Long Distance says, "Wait a minute"—probably a patron must have attention, having come in to pay his bill. The patron must have attention at once or he will get impatient and leave, and then the manager comes in and wants to know why so and so did not pay his account.

The correct timing on toll calls is one problem. It seems it is impossible for the smaller exchanges to get their time always the same as the toll centers, even though every ticket is checked after each call. We still receive error sheets. The oprators should always agree on time and make it the same, or the company has to pay the other fellow's bill.

The subscribers in a small town know their operators so well that they often ask too many favors of them, and this frequently holds up the service. We are often asked to hunt up a party when the one calling has no idea where that party can be found, time of day, when different trains are due, the score of the baseball game and who pitched for the home team and—well, you know the rest of the gossip—about who got married, such a nice girl and so forth.

Operators often visit at the board or entertain in the office. These habits, once formed, are hard to break, and service takes a back seat.

To me, one of the hardest problems a telephone operator has to face and master is to learn to control her temper. Who

likes to hear a grouchy voice snapping at you. If you must say something, close your key—and then say it! I think there is never any time when one must lose entire control of one's temper. How much better to be kind, cheerful and pleasant. The subscriber will often feel worse when treated that way but can't answer because he is so taken back—and it all ends lovely.

A foreigner returning to his native home after a visit to this country was asked what impressed him most here in America and his quick reply was, "The sweet, ever-pleasant voice of the American telephone operator." That is wonderful. Let us all do our best to live up to it.

When we are on duty, our minds should be on our work, when we enter the operating room, we should forget everything else and throw our whole selves into our work. Don't look at the clock all the time and wonder, "How soon will I be going off duty?" Time goes very swiftly when one is absorbed in one's work. All work that is honest is honorable, so let's be glad we can work and be one of these who are making this old world a better place to live in.

Hunting up a patron without a definite address is a little extra work, but what is extra work compared to satisfied patron? Almost every day we read thrilling accounts of the wonderful service an operator rendered during fire, flood or storm. Think what it means to be one who has a part in saving of human lives!

Our work should not be satisfactory to ourselves unless we have done our very best—all that is within our power to do.

After all, there is only one solution to all our problems as telephone operators—only one way we can make substantial and lasting progress—and that is in the application of the Golden Rule, "Do unto others as you would have others do unto you."

Communications' Conference at Mexico City Nears End.

The Congress on Electrical Communications, which has been in session in Mexico City since the latter part of May, will have its formal wind-up on July 22, when the Mexican Ministry of Foreign Relations will tender a farewell banquet. The American delegates plan to depart for Washington on July 23.

The work of the congress has been devoted to promoting means for harmonizing the rates between the privately-owned lines and communications, as in the United States, and government-owned lines in Central and South America.

This meeting of the congress was a preliminary one to get the delegates of this continent together for the formal conference to be held at Paris or Rome this fall. The United States was represented by Charles B. Warren, American ambassador to Mexico, Representative White of Maine, and Allen H. Babcock, electrical engineer of the Southern Pacific Railroad.

New York District Meeting and Conference at Plattsburgh.

A district telephone meeting and traffic conference of the Up-State Telephone Association will be held at Plattsburgh, N. Y., on Friday, July 25.

The convention has accepted an invitation to hold its sessions in the new building recently erected by the Northern New York Telephone Corp., a description of which appeared in TELEPHONY of June 7.

Every telephone company within the district is urged by Vice-President and General Manager J. G. Ihmsen to send several representatives and as many telephone operators as possible to the meeting. Hotel accommodations should be reserved in advance at Witherill Hotel.

FUNDAMENTAL TOLL TRAFFIC ESTIMATES.

(*Continued from page* 16.)

trial plants have not been established for so long a period a very noticeable increase in the toll calling rate per station is indicated year by year. If such an increase in toll calling rate per station is noted, then one can expect a substantial increase on the percentage basis to be more nearly true. It should be noted that the percentage increase method of projecting future toll traffic takes into account both population increase and an increase in toll usage per station.

In the case of a toll calling rate curve with a distinct upward curve, an average of three or four peak points in each of the last two years should be taken as a base and a future toll calling rate per station estimated by straight line projection on the slope indicated by past experience. This future toll calling rate per station may then be applied to the commercial forecast of expected future local stations, to arrive at the number of expected future toll calls.

For the long-time estimate, we have these three methods of arriving at the expected volume of toll traffic: Straight-line projection, or rubber-band method, percentage increase method, and toll calling rate per station method.

It is possible that three different results will be obtained. The estimator's judgment is again called upon to make a decision. General business conditions can hardly be taken into account in the judgment factor, for one would have to be a seer, indeed, to foretell those 20 years hence, but if he has a one-industry town to consider, some consideration can usually be given to the possible future of that industry.

There are, however, many sources of information in the line of economic surveys which show the long period cycles of growth and development of certain industries price trends, etc., which may be of considerable value for consideration when making the estimate. If the estimate is being made by a traffic man, he should consult with the commercial people before adopting the final estimate.

In the end it is necessary for the estimator to use his judgment in connection with the three independent estimates he has made to determine what figure is the most reasonable and nearest to the probable value.

What May Be Expected of Estimates.

In general, estimators are of two classes —pessimistic and optimistic. In between these two classes are a few individuals who use rare good judgment.

If an exact estimate were an easy or a simple thing to make, many of us would apply that estimating ability to gauging the stock market and become very wealthy, so it behooves all of us to refrain from casting reflections on the accuracy of estimates made by others if they have been made in a careful manner based on tried methods. Indeed, no criticism is in order at all unless a better estimate can be produced by the one making the criticism.

It is well not to disparage the optimistic long-time estimate too much, for looking back, say, 20 years, if anyone had estimated the present-day volume of toll business, that estimate would have been thought beyond all the bounds of possibility by contemporaries of those days. We have no guarantee that a similar rate of growth will not be experienced during the next 20 years, even though most of us are inclined to doubt it.

It is not the purpose of this paper to explain the use of the fundamental toll traffic estimates, in their detailed applications as to method of determining force requirements, switchboard requirements, etc., as those are large subjects in themselves, but the thing to be remembered is that the fundamental estimate of the volume of business is the groundwork upon which all other traffic estimates and calculations are based and that this fundamental estimate must be made very carefully.

Oftentimes more work is expended on the use of the fundamental estimate *after it is made* than is expended on the making of the fundamental estimate itself; and this is not sound practice, for why calculate position requirements to two decimal places when the fundamental estimate on which the calculation is based may be 25 per cent off?

Prices in the Metal Markets.

New York, July 14.—Copper steady; electrolytic, spot and nearby, 12⅜c; futures, 12⅜@12½c. Tin firm; spot and nearby, 45.25c; futures, 45.37c. Iron steady; No. 1 northern, $19.50@21; No. 2 northern, $19@20; No. 2 southern, $18.50 @19. Lead steady; spot 7c. Zinc steady; East St. Louis, spot, 5.85c; futures, 5.85@ 5.90c. Antimony, spot, 8.25c.

What Is Your Company Doing?

Chats About Company Doings

By Stanley R. Edwards.

A recent Saturday issue of The News-Sentinel, Fort Wayne, Ind., contained a full page feature article entitled, "Fort Wayne of Tomorrow in the Light of Yesterday."

It was written by E. L. Gaines, traffic superintendent of the Home Telephone & Telegraph Co., and illustrated with a number of charts and curves presenting graphically data regarding Fort Wayne's growth in many directions — financial, population, buildings and the business of the various public utilities.

Mr. Gaines developed a most interesting article and shows Fort Wayne has doubled its business activity in the past four years through a healthy, steady growth which is not a boom of the moment.

"It is not the dreamer who makes possible the greater city of tomorrow," says Mr. Gaines. "It is the cool, calculating business man, aided by his corps of engineers and accountants and every latest method and device known to modern business and science. It is true the business man must also be a dreamer. He must be a seer in the finest sense of the word, but he dare not be ruled by his dreams.

"From his dreams come ideas that must be backed up by facts; for cities are built on facts, not fancies. Yet, the man who would build for the future must first see the future. He must be able to see his business as it should be ten years from now and build toward that vision.

"He must know what his customers will want tomorrow and provide for those wants today. And he must look beyond his own business and see his city of tomorrow; visualize its problems, its needs, its advantages, and do his part to help provide and share them.

"He must see his city's streets flowing with the traffic of 10 and 20 years from today and help prepare those streets to carry it. He must visualize the needs of his city's public utilities 10 and 20 years in the future and work with them to fill those needs, for if they cannot meet them his city cannot grow.

"He must take an active and intelligent interest in all civic and municipal affairs in order that they do not lag and obstruct the way of progress. And, in order that he may have this vision of his city's future, he must study its past and present development, especially as that development is revealed in the records of its public and semi-public services.

"The records of bank clearings, public utility activities, postoffice receipts and building permits; these are most important as an accurate index to the future and when all of these point in one direction over a considerable period of time that direction cannot be mistaken.

"It is true that the direction may deviate slightly from a straight line but the general direction will remain unchanged, and

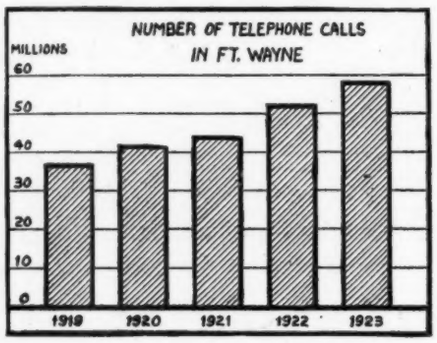


Chart Showing Growth of Ft. Wayne's Telephone Traffic During Past Five Years.

when that direction is upward, when steady and consistent progress is shown along all lines, the man is shortsighted indeed who will not prepare himself and his business to keep up with the indicated rate of progress and grow with his city.

"In order properly to interpret the statistics of a community, the nature or characteristics of that community must be known. Cities have individualities just as people have and some are changeable, unstable and erratic while others are steady, dependable and even temperd.

"Boom towns are usually in the first class. They may have a remarkable growth for a few years and then a period of business depression occurs and they drop back again until another boom comes along. And sometimes it never comes.

"The second division contains the cities where growth is usually slower, but more consistent. Cities of this class don't have booms. A study of their business statistics will show a continued steady growth—little affected by general business conditions over the country, either good or bad.

"It is to this class of cities that Fort Wayne belongs and for this reason our statistics of business activities may be taken as a fairly accurate index to the future. Fort Wayne has never had a bank failure. For Wayne has an exceedingly high percentage of home owners. Fort Wayne has a large number of industries manufacturing a diversified line of economic necessities. Fort Wayne is not dominated by any particular faction, group or interest.

"All of these factors tend to steady and stabilize the city as a whole. Fort Wayne has never experienced a decrease in population. For the past 100 years the increase has been steady and for the last 50 years the rate has been steadily increasing.

"However, it is when we study the activities of the past five years, beginning with 1919, that we find the most interesting indications of a change and it is with the figures for these years that we are most concerned at present in forecasting the immediate future."

Statistics regarding bank clearings, postal receipts and water supply are then presented, charts and curves aiding to make clear the rates of increases.

The utilities are next discussed, telephone, street cars, gas and electricity being taken in the order given. Of the telephone was said:

"A total of 57,767,000 telephone calls were made in Fort Wayne in 1923. This is an increase of 58 per cent over the number of calls made in 1919, an average gain of 14.5 per cent per year. Chart No. 4 shows the gain more clearly. Records for the first quarter of 1924 indicate a 20 per cent increase over the first three months of 1923.

"The volume of telephone traffic has increased so rapidly and the demand for telephones has been so great during the past few years that the Home Telephone & Telegraph Co. has at times been unable to supply the demand.

"Although growth at the pre-war rate would have been provided for, the increased growth rate of the post-war period proved too large to be handled with available facilities. In spite of the fact that telephone installations have been double the number installed in pre-war years, as many as 1,000 applicants have been waiting at one time during the past year.

"Three years ago the telephone company realized that Fort Wayne was rapidly outgrowing its telephone facilities and began the engineering and commercial survey work necessary to provide a new system adequate for the future needs of the city.

"Plans have been made which not only provide for a complete new automatic telephone system for Fort Wayne, but which also make provision for future additions to the system as the growth of the city requires. The new plant will be built on the central office unit plan which will permit of unlimited expansion by the addition of more central offices without changing then existing offices. This will guarantee ample telephone facilities for the greater Fort Wayne of tomorrow.

"The telephone company is now in the midst of a $3,000,000 rebuilding program which embraces the laying of all main feeder lines in underground cables as well as changing the system from manual to automatic operation and building two new central offices. These new offices will have

switching capacity ample to take care of three times as many telephones as are now in use in Fort Wayne."

Building permits and population increases conclude the data discussed by Mr. Gaines who concludes the articles with this boast for Fort Wayne and suggestion for investing in its utilities:

"Surely anyone giving these facts and figures a little consideration cannot help having faith in Fort Wayne and the future that is in store for it. 'Invest in Fort Wayne' should be made the slogan of every Fort Wayne citizen. Have faith in your own home town and others will have faith in it also and be attracted to it. Opportunity lies in a growing city and was never so great in Fort Wayne as today."

The article made such a good impression that it has been published by the Conventions, Tourist, Publicity and Social Bureau of the Fort Wayne Chamber of Commerce, in the form of a "booster" booklet.

Thus the Home company receives considerably greater publicity than was attached to the appearance of the original article in The News-Sentinel.

Personal and Biographical Notes

J. C. Paxton, since the first of the year assistant to the president of the United States Independent Telephone Association, has severed his connections with the national association to enter the commercial department of the Southwestern Bell Telephone Co. at St. Louis, Mo.

Mr. Paxton is one of the youngest men to have attained a position of considerable prominence in the telephone field. Although but 28 years of age he has had 11 years of experience in the industry, his first position being with the Iredell Telephone Co., of Statesville, N. C.

After several years of experience with the Iredell company, Mr. Paxton moved to Sherman, Texas, in 1916. Following a brief period of service with the chamber of commerce of that city, as bookkeeper, he became affiliated with the Grayson Telephone Co. as auditor in June, 1917.

While with the Grayson company, Mr. Paxton installed a central accounting system and established a statistical department. From the fall of 1918 to the summer of 1919 he served Uncle Sam, returning to the Grayson company August 1.

Mr. Paxton's efficient work with the Grayson company was rewarded, in 1920, by his promotion to the position of assistant general manager of the Associated Telephone Companies, from which he resigned to become assistant to President F. B. MacKinnon of the national association.

J. C. Paxton Is Now With the Southwestern Bell Company's Commercial Department at St. Louis, Mo.

Grover C. Johnson, one of the best known Bell men in Nebraska, has been named as division plant engineer of the Northwestern Bell Telephone Co. for North Dakota. He began his work in the Bell office at Minden, Neb., and has held positions at the exchanges at Grand Island, Central City and Norfolk. For the last two years he has been a member of the staff of the Northwestern Bell Telephone Co. in the Nebraska plant engineer's office at Omaha.

W. D. Stevens, a well known farmer and supervisor of the town of Ogema, Wis., is now manager of the Ogema Telephone Co., a plant serving some 300 patrons. Carl M. Fryk, who has been manager of the company for several years, has taken a position in the city of Chicago.

L. Wingett, manager of the Wapakoneta, Ohio, Telephone Co., left Saturday for a fishing trip in Michigan. We hope he will send us some prints demonstrating his fishing ability, for fish stories are hard to believe without evidence of some kind.

Dr. Walter Splawn, member of the Texas Railroad Commission, has been named president of the University of Texas. He will assume his new duties before September 1.

Obituary.

Charles E. Tarte, assistant chief engineer of the Michigan Bell Telephone Co., passed away recently at his home in Grand Rapids, Mich., at the age of 55.

Mr. Tarte was a pioneer in the Independent telephone field. He was general manager of the Citizens Telephone Co., of Grand Rapids, from 1900 until September of last year when the properties of the Citizens company were merged with the Michigan Bell. Upon the consolidation of the systems he was made assistant chief engineer for the Bell company.

Mr. Tarte was for many years a director of the United States Independent Telephone Association. He was also for years president of the Michigan Independent Telephone & Traffic Association.

The Late Charles E. Tarte Was a Pioneer in the Independent Field and a Prominent Figure in Association Activities.

Born in Muskegon, Mich., October 31, 1869, Mr. Tarte was educated in the parochial and public schools of Muskegon. He began his business career at the age of 12, selling papers and carrying messages for the Western Union Telegraph Co. His telephone career commenced in 1883 as night operator for the Michigan Telephone Co. at Muskegon. Later he became traffic manager for the company at Grand Rapids and Detroit.

After serving as switchboard man for the Northwestern Bell Telephone Exchange Co., at St. Paul, Minn., Mr. Tarte became affiliated with the Citizens Telephone Co. of Grand Rapids. He was promoted, successively, from the positions of traffic manager, wire chief, local manager of the company, becoming general manager in 1900.

During the period of government operation of the telephone systems in 1918 and 1919, Mr. Tarte was supervisor of the Independent telephone lines in Michigan.

Strowger Automatic in Canal Zone

Plans Announced Which Cover Complete Conversion of Entire Canal Zone Telephone System to Strowger Automatic Operation—Project Involves Initial Installation of Four Central Offices With a Total Capacity of 3,000 Lines

By H. E. Clapham

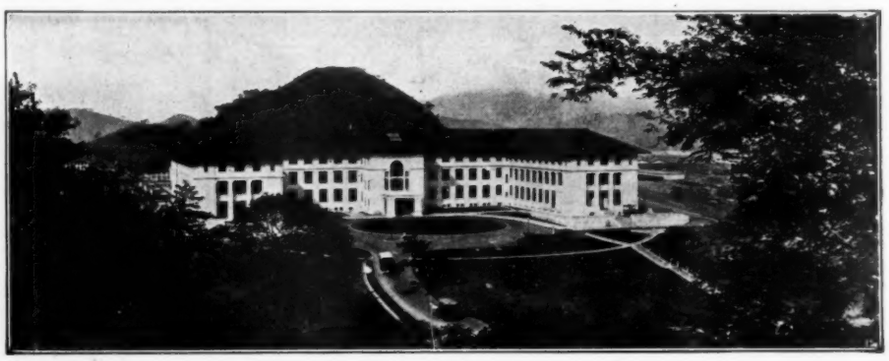
The Panama Canal Commission has placed orders with the Automatic Electric Co. for the complete conversion of the Canal Zone telephone system to Strowger automatic operation. The initial installation will have a capacity of approximately 3,000 lines distributed among the four central offices at Cristobal, Gatun, Pedro Miguel and Balboa.

An engineering utility of first international importance, the Panama Canal has always been foremost in the adoption of any development that means the saving of time, the reduction of errors or greater certainty in operation and administration. It is only natural, therefore, that one of the next logical steps in the development of this great enterprise, this "Great Canal of a Great People" as Governor Jay J. Morrow of the Canal Zone has aptly termed it, should be the conversion of its telephone exchanges to the automatic system that is now in use in every part of the world.

The possibilities afforded by automatic telephone service in the Canal Zone began to interest the administration many years ago. In 1918, C. L. Bleakley, supervisor of telephone and telegraph of the Panama Canal, which operates the Canal Zone telephone system for the Panama Railroad, paid a visit to the United States for the purpose of making a study of the various types of telephone systems in use in various parts of the country.

Mr. Bleakley was very much impressed with the efficiency of operation of the many Strowger automatic exchanges that he saw in operation. The more he considered the matter, the greater became his conviction that the ideal method of handling telephonic communication within the Canal Zone would be by means of automatic switching.

As a result of his investigations, a 50-line C. A. X. was installed at Gamboa, midway across the isthmus. At a somewhat later date, P. A. X.'s were installed at Fort Clayton and Fort Davis.



Administration Building, Balboa, C. Z.—An Automatic Telephone Switchboard Will Be Installed in the Top Floor of the Left Wing.

In the preliminary consideration of the work of converting the whole of the remaining system, two important obstacles presented themselves, one a natural operating condition and the other an operating artificial requirement.

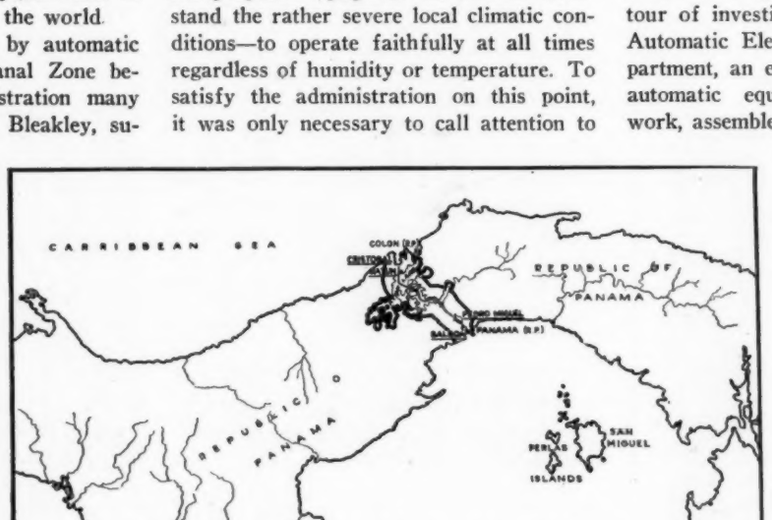
In the first place, it was necessary that the proposed equipment be able to withstand the rather severe local climatic conditions—to operate faithfully at all times regardless of humidity or temperature. To satisfy the administration on this point, it was only necessary to call attention to the successful operation of Strowger automatic exchanges in other tropical countries, such as Cuba, Hawaii and the Philippine Islands.

The engineering requirement involved is brought out by the fact that charges for telephone and trunk service anywhere within the Canal Zone are such that the intercepting of calls for the collection of tolls is unnecessary. The entire telephone system thus resolves itself into a four-office network arranged on a free service basis, and with an operating territory extending the full length of the Canal. To carry traffic between exchanges without the services of operators, it was, therefore, necessary to arrange for the accurate transmission of dial impulses over the quadded and loaded trans-isthmian cable.

To demonstrate the ability of Strowger automatic equipment to meet this condition, voiced by Mr. Bleakley while on his tour of investigation, John Wicks, of the Automatic Electric Co.'s development department, an expert on the application of automatic equipment to long distance work, assembled some equipment and took it down to the Canal Zone to show its operation under actual working conditions. The working of the apparatus was entirely satisfactory.

These two problems being disposed of, specifications were drawn up in due course, bids were asked for and, after mature consideration of all details by the engineering and maintenance officials of the Canal, including Col. Walker, engineer of maintenance, W. L. Hersh, electrical engineer and Mr. Bleakley, the contract was finally awarded to the Automatic Electric Co.

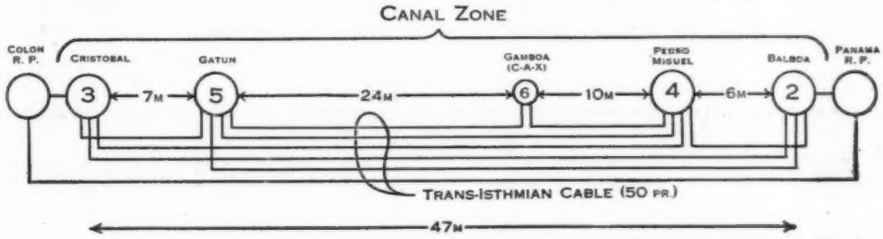
The present telephone



May of the Panama Canal Zone, Showing the Location of the Telephone Exchanges to Be Converted to Automatic Operation.

system of the Panama Canal is operated through four main exchanges—Cristobal and Gatun at the north or Atlantic end, and Balboa and Pedro Miguel at the south or Pacific end.

The exchanges at Colon and Panama,



Trunking Scheme for the Canal Zone Automatic Exchanges—The Figures in the Circles Refer to Selector Levels Used in Trunk Distribution.

both of which, although geographically within the Canal Zone, belong to the Republic of Panama, are operated as separate properties by the Panama Telephone Co.

The telephone system of the Canal Zone is operated primarily for the transaction of the official business of the various departments of the Panama Canal, the Panama Railroad, and the United States Army and Navy. Provision is also made for residential telephone service and for steamship agents and other commercial interests that carry on activities within the Canal Zone.

The traffic between the exchanges is carried over the 50-pair cable which extends alongside the Panama Railroad from Balboa on the south to Cristobal on the north. This cable is carried underground in a four-duct line, except at the water crossings, where it is carried as an armoured submarine cable.

All of the wires of the cable are looped in and out of each of the four main exchanges and terminated on blocks at each place and cross-connected for purposes of testing. This arrangement also offers the utmost flexibility in the use of cable pairs of trunk connections between various offices.

While the traffic of the Panama Canal telephone system is almost entirely carried within the boundaries of the Canal Zone, the offices at Balboa and Cristobal are trunk-connected to the offices of the Panama Telephone Co. at Panama and Colon respectively.

Traffic originating in the Canal Zone and destined for some point outside of it is handled without interception for toll or any other purpose. The Panama Telephone Co. collects tolls for calls originating in its system and destined for points within the Canal Zone, but the interception of such traffic is handled by the operators of the company.

From the foregoing it may be seen that the Panama Canal system offers an unlimited service unhampered by toll procedures. This not only makes for simplicity of operation but also quickens the service and expedites the traffic and communication in general.

The installation of the automatic system will provide for a continuance of the same general trunking arrangement, but none of the lines or trunks will be handled on a manual basis. The whole network will be technically similar to a Strowger automatic multi-office network, with direct trunks between all of the four main offices. A universal directory will be issued and the numbering scheme will be on a four and five-figure basis.

The largest exchange to be converted is that at Balboa, adjoining Panama at the south end of the Canal. The administration offices of the Canal are located at this point, and the automatic switching equipment for this office will be installed in this building. The initial installation for this office will consist of 16 100-line units.

The new exchange at Cristobal, at the north end of the Canal, will have an initial installed capacity of 900 lines. A new building will be erected for this exchange.

At Gatun, about six miles directly south of Cristobal, are located the Gatun locks, consisting of three pairs of chambers leading upwards in steps to Gatun Lake, the main body of which is 85 feet about the sea level. At Gatun will be located an automatic exchange having an installed capacity of 300 lines.

The locks at the south end of the Canal are located at either end of Miraflores Lake, two steps at Miraflores and one at Pedro Miguel. At Pedro Miguel will be installed the fourth automatic exchange, to have an initial capacity of 300 lines.

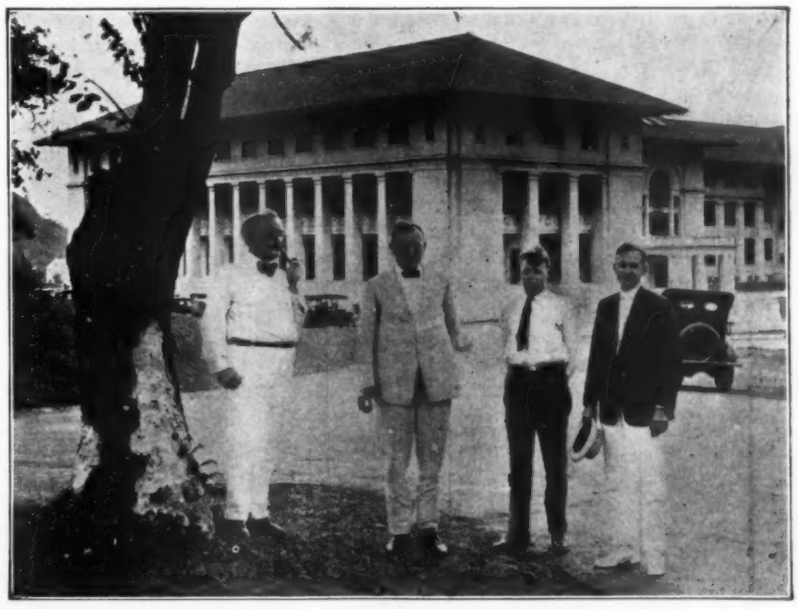
All of the equipment installed will be similar in general character. The line switches will be all of the rotary type and the types of service to be rendered will include single line, P. B. X., and two-party (divided ring).

The exchanges at Pedro Miguel and Gatun will be normally unattended, being supervised by remote control from Balboa and Cristobal, respectively.

For interchange of traffic between the Panama Canal system and that of the Panama Telephone Co., trunk service is arranged between Colon and Cristobal and between Panama and Balboa. Three of the trunks in the 50-pair cable are rented to the Panama Telephone Co. for cross-country service, leaving the remainder unhampered for Canal Zone use.

The trunking plan for the entire automatic network is shown in the accompanying diagram. This is not intended to show the geographic relationship of the exchanges, but merely to indicate the connecting scheme and the use of the trans-isthmian cable for the interoffice trunks.

The C. A. X. at Gamboa was installed in 1919 and was the first automatic equipment to be installed in the Canal Zone. Other automatic equipments already installed are the P. A. X.'s at Fort Clayton and Fort Davis, with trunk connections to Pedro Miguel and Gatun respectively. At the highest point of the Isthmus, at Darien, is located a large naval radio station. This is operated over trunks of



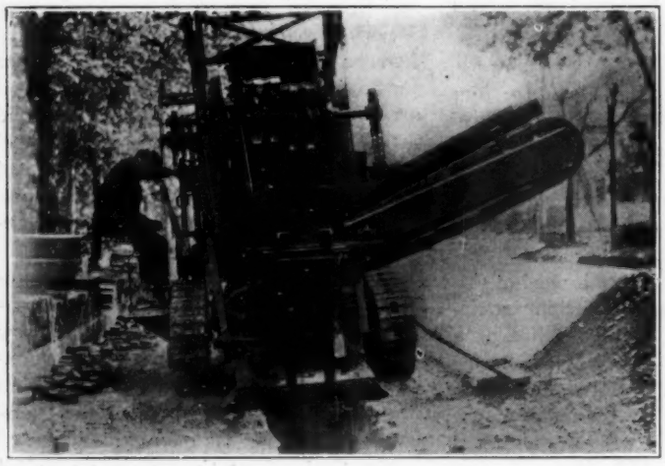
These Men Helped to Solve the Telephone Problems of the Canal Zone—Left to Right: C. L. Bleakley, Supervisor of Telephone and Telegraph; F. Holmstrom, Jr., Manager Eastern Division, and W. A. Chapin, Sales Engineer, Automatic Electric Co.; and W. L. Hersh, Electrical Engineer, Panama Canal Zone.

the trans-isthmian cable from Balboa and Cristobal.

It is expected that the use of Strowger automatic telephony will be of the utmost value to the Canal in increasing the service to shipping. By means of the full automatic connections over the trunks, the personnel of the operating units at each point along the Canal can be kept informed at all times as to the needs of shipping passing through. A large part of the business of the Canal, both operation and administration, is handled by telephone.

While the organization of the Panama Canal administration gives an impression of remarkable smoothness and quietness, its efficiency is unexcelled. There is a constant struggle, not apparent to the casual visitor, on the part of the administration to keep the ideal of efficient service constantly to the front, and the decision to convert the telephone system to Strowger automatic, while but one of many developments and improvements constantly under way, is typical of the foresight and watchfulness of those in whose hands the destinies of the Canal lie.

From Factory and Salesroom



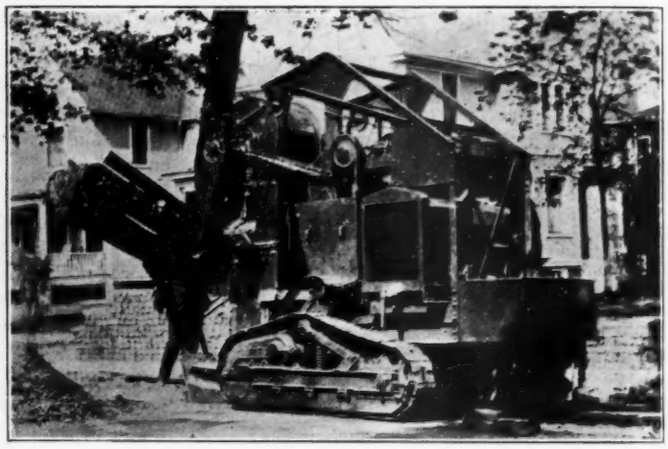


Fig. 1. Wisconsin Telephone Co. Ditcher Being Used to Dig Trench for Conduit—Fig. 2. Another View of the Same Operation.

Machine That Is "Almost Human" Saves Trench Digging Costs.

Underground construction in the telephone field is increasing in popularity year by year, for although the initial cost is apparently higher than aerial construction, the maintenance cost is reduced to a very minimum. Thus in the long run underground construction has proved to be the most satisfactory and economical type of outside telephone construction work.

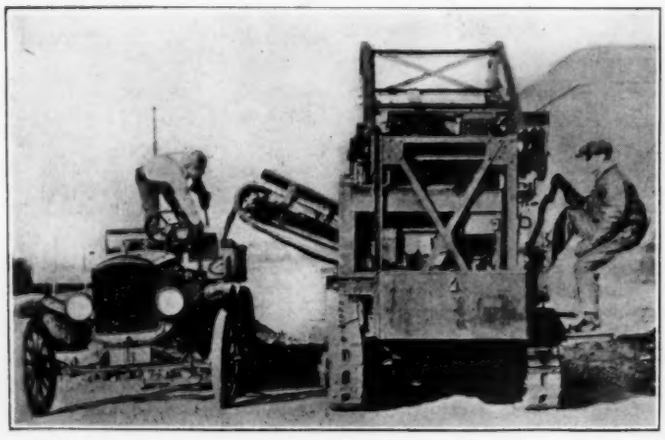
One of the most costly factors in laying underground cable is the cost of the labor necessary to dig the trenches with pick and shovel. Not only is trench-digging by man-power an expensive process; it is an exceedingly slow and tedious piece of work.

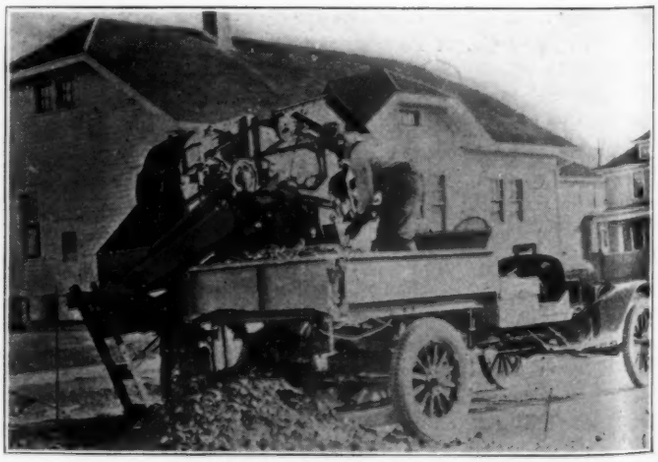
Excellent results have been obtained by a number of telephone companies in the use of machine-power for digging their trenches for underground cable construction. The Barber-Greene ditcher, illustrated on this page, has found favor among all of its users, as is testified by the re-orders received during the past year.

The results obtained by users of Barber-Greene ditchers are mainly: 1, reduction of the shovel gang; 2, greater speed in trenching; and 3, great reductions in the cost of digging trenches. In addition, the Barber-Greene ditcher is able to dig ditches in close quarters where heretofore it has never been possible to use anything but a pick and shovel gang.

The Wisconsin Telephone Co. has two Barber-Greene ditchers in service, one of which was purchased in August and the other in November, 1923. The company has used these machines in nearly every part of the state, working them in Madison, Eau Claire, Hudson, Milwaukee, Kenosha and other cities and towns.

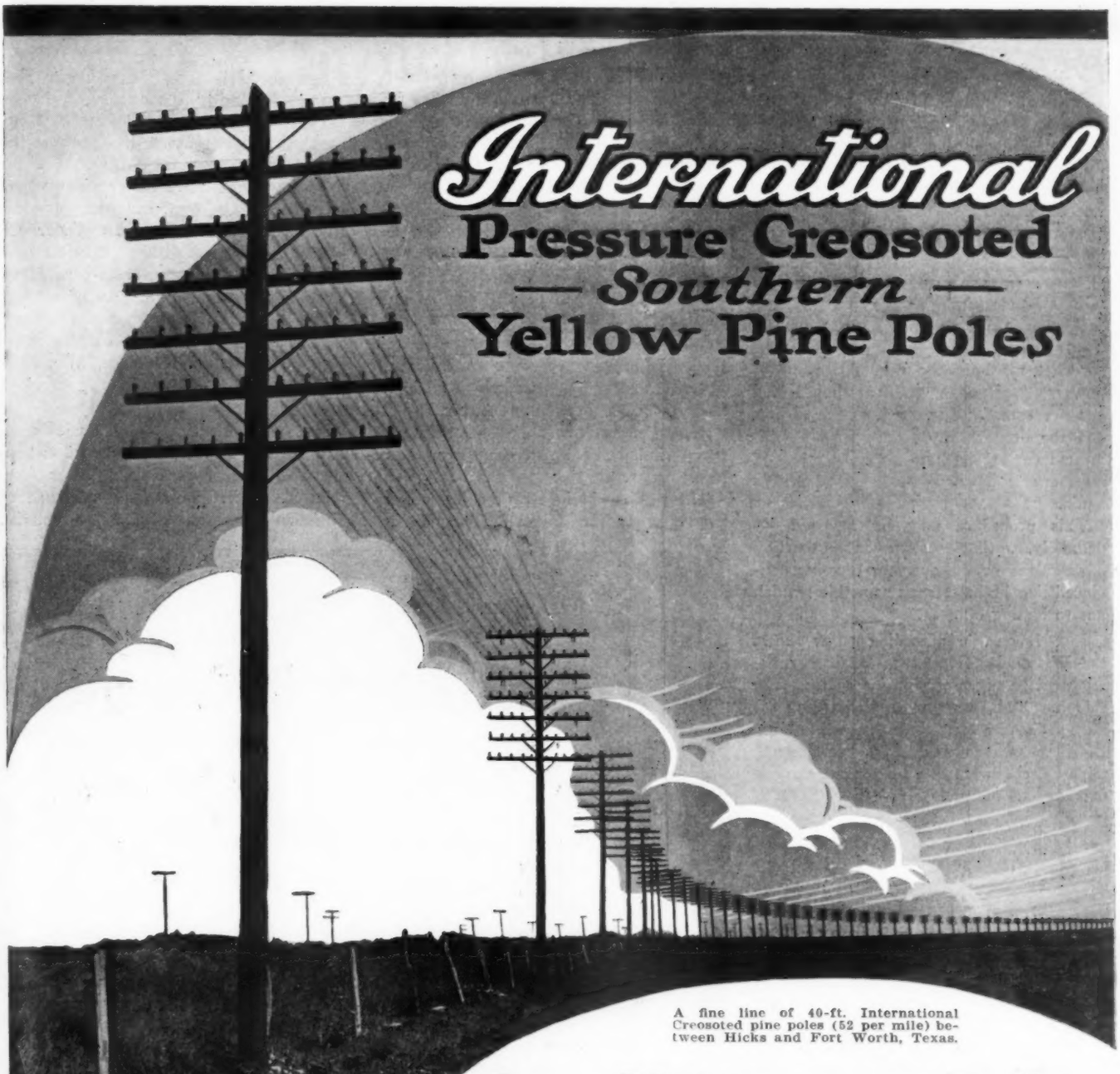
In commenting upon the Barber-Greene ditcher a foreman of Kenosha said: "The darn thing is almost human.





Figs. 3 and 4. The Wisconsin Company Saves Time in Excavating by Discharging Direct from the Machine to the Truck.

International Pressure Creosoted — Southern — Yellow Pine Poles



A fine line of 40-ft. International Creosoted pine poles (52 per mile) between Hicks and Fort Worth, Texas.

Save Maintenance Dollars

International Creosoted Pine Poles are known to save maintenance dollars because they resist decay, resist fire, are more durable and therefore last longer.

Their great breaking, shearing and bending strength enables them to withstand severe wind and sleet storms without breaking. Their long life and great durability decrease maintenance expense and yearly amortization charges.

International inserts a copper dating nail in every pole. This nail is a means of identification and serves as a record of their service. It also gives assurance of the superb quality of the timber and the preservation used and of the conscientious methods by which *International* Poles are produced and treated.

International Creosoting & Construction Co.

General Office—Galveston, Texas

Plants: Texarkana, Texas Beaumont, Texas Galveston, Texas

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

When we come to a bad rock the machine keeps picking along at it until it loosens it. When we strike a pipe underground, the ditcher just catches a hold of it, and the safety release sprocket works. Although we have struck a number of pipes we haven't broken a single one of them. The ditcher seems to know the difference between hard digging and what it should not dig up."

The safety release sprocket which makes this human-like performance possible was designed to replace a sprocket with a breaking pin with which the company's original machines were equipped. Two springs under compression in the sprocket maintain the normal stream of power. Any undue strain at the digging end overcomes the strength of the springs and the outer half of the sprocket slips around coming back to normal again. If the strain is still present, the sprocket slips again.

This procedure may be repeated indefinitely, until the stone or obstruction is dislodged or the operator becomes convinced that he has struck something which has to be dug out.

Fig. 1, on the preceding page, shows the Wisconsin Telephone Co. ditcher being used to dig a trench for conduit. In this case the conveyor is discharging direct from the ditch to the spoil bank. Fig. 2 is another view of the same operation. The other two photographs show a machine discharging direct from ditch to truck.

In all conduit work, as telephone men know, a certain proportion of the ground excavated cannot be replaced into the ditch after the conduit is placed. In the case illustrated the Wisconsin company is saving time by loading direct from the ditcher conveyor into Ford trucks. The same operation was carried on by the Chesapeake & Potomac Telephone Co.

As it is desired to dig deeper, the ordinary conveyor would not reach high enough to discharge into the trucks. The Barber-Greene company met this difficulty by furnishing the companies with a longer conveyor which reached to the proper height and permitted them to carry off directly from the ditch the necessary proportion of the spoil.

Last fall the Barber-Greene ditcher speeded up work for the J. T. Cuddy Co., in connection with its telephone conduit work in Apponaug, R. I. when the pick and shovel gang seemed too slow, and saved the company a penalty on a large contract.

Mr. Cuddy had a contract which required that the work be completed December 31, 1923, with a penalty attached if he did not complete the work by that time. He started the job with 60 men and gradually found himself getting behind. There were constant changes in the pick and shovel gang, and the work did not proceed as fast as it should have done.

The Barber-Greene ditcher arrived in October and was put to work immediately. After the machine arrived, the pick and shovel gang was kept on the job also, but the ditcher seemed to act as a peacemaker and the contract was completed on November 30, 1923, a month early.

After this another contract for 3,000 feet of conduit work was taken and finished before December 20, 1923. The ditcher made it possible to get this extra work and saved the penalty on the large contract.

Wide use under the severest of conditions has proved every phase of Barber-Greene construction practical. And in its latest model ditcher, No. 44-A, the Barber-Greene Co. has given excess strength to every vital part without changing a basic idea.

The results obtained by the many companies using the Barber-Greene ditcher are given in photographs, descriptions and even detailed costs in the booklet entitled, "Modern Ditch Digging," A copy of it may be obtained upon application to the Barber-Greene Co., Aurora, Ill.

A Glimpse Along the "Jack Soldering Line."

A glimpse into the switchboard cable department in the manufacturing plant of the Kellogg Switchboard & Supply Co. is given in the accompanying photograph.

A view of one job is given and shows the switchboard cable in the foreground with jacks and wire ready for shipment.

At the extreme left can be seen one of the company's strong packing cases with the jack racks in its center. In the background is the wiring department where the jacks are soldered on to the cable. By means of balancing weights, the cable is raised off of the soldering table out of the way of the workers "in the line," as the soldering is done.

Page & Hill Co. Take Over Red Cedar Company.

Page & Hill Co., of Minneapolis, Minn., has recently purchased the Metropolitan Cedar Co. at Spokane, Wash.

The western red cedar resources of Page & Hill Co., combined with the added stocks of the Metropolitan Cedar Co. places the Page & Hill in a better position than ever before to take care of the increasing demand of its customers.

The Page & Hill western offices formerly located at Newport, Wash. are now in the Peyton Building at Spokane, Wash.

Paragraphs.

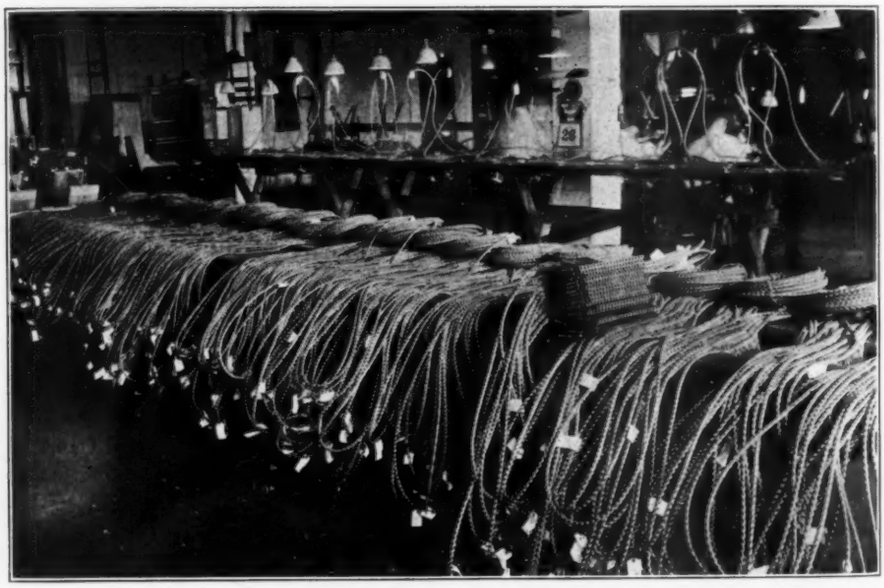
HARRY N. FARIS, Kansas sales manager for the Kellogg Switchboard & Supply Co., recently received a letter from John T. Faris, editor for the Board of Christian Education of the Presbyterian Church, regarding Harry's suggestion for improving his aerial. He wrote:

"Your word concerning our aerial will be kept in mind. The facts are, however, that the results have been so satisfactory that we have been willing to let matters rest."

Mr. Faris' comment, regarding his relative's radio, is characteristic; "You see, even a preacher-editor can get results with Kellogg radio."

J. E. SEAMAN, long connected with the pole industry in the production of western red cedar poles, has just joined the Page & Hill organization as manager of western operations, with headquarters at Spokane, Wash.

Mr. Seaman is well known in the western red cedar pole industry and this, combined with his wide experience, fits in particularly well for his new work with Page & Hill Co.



View of Kellogg Cable Department Showing a Job Ready for Shipment.

SEND THOSE BLUEPRINTS OVER IMMEDIATELY

But does it mean anything? Do you get them on time? If the commercial blue printer has Pease Blue Printing Equipment you do. But why not have your own Pease and let it wipe out all blue print worries?

No delays, no distorted prints, no open trays of water, no dripping lines of prints or wet floors, perfect, deep blue, clean cut, white line prints whenever you want them regardless of weather conditions. Not a myth but a reality made possible by the Pease Vertical and Sheet Washer.

Lower Blue Print Costs In The Bargain

The Pease Vertical reduces operating and maintenance costs of your blue printing department to a minimum. The cost of the finished print, printed, washed and dried is what counts and here is where Pease Equipment shines.

Let us give you complete information together with prices. It will pay you to investigate. A line on your letterhead will do. No obligation.

Just ask for Catalog M-04.

THE C. F. PEASE COMPANY

804 N. Franklin Street, CHICAGO, ILL.

Blue Printing Machinery *Drafting Room Supplies*

Partial List of Telephone Users

Pacific Tel. & Tel. Co., San Francisco, Cal.

New York Telephone Co., New York City, N. Y.

Bell Telephone Co., Philadelphia, Pa.

Southern Bell Tel. & Tel. Co., Richmond, Va., and Atlanta, Ga.

Michigan State Telephone Co., Detroit, Mich.

Binds Any Load Securely and Safely

Stacy Load Binders eliminate all risk and danger of binding poles, lumber, etc., as with the old fashioned, dangerous boom poles. You simply pass chain around the load—attach the two hooks of the Stacy Binder in the links of the chain—pull down the lever and your load is *bound* and *bound* to stay.

Telephone companies find

Stacy Swivel Load Binders

big time and labor savers—also a big factor in preventing serious and expensive accidents caused by loads slipping off.

Stacy Load Binders are made in two sizes—Regular and Jumbo. Regular size sells for $2.50 each—$5.00 a pair. Jumbo size sells for $3.75 each—$7.50 a pair. For sale by leading hardware dealers and hardware jobbers. If your dealer can't supply, order direct from

EUGENE C. STACY, Manufacturer
TIFFIN, OHIO

Mr. Eugene C. Stacy,
Tiffin, Ohio.

Dear Sir:

I will state the question of using the Load Binder, as described in your circular, was taken up at our Accident Prevention Committee Meeting and everybody agreed that they were O. K., and instructions have been issued to order as many as necessary.

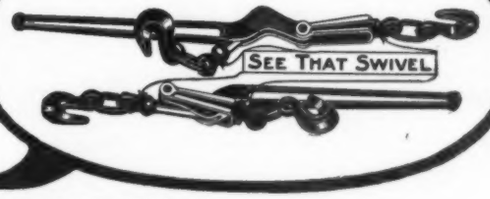
The Chairman of the General Accident Prevention Committee has been trying them out, and my last report was that they were entirely satisfactory and that they would be made standard and would replace all boom poles.

If you have not received any orders direct, you will probably receive same from the Western Electric Company, as all our material is ordered through them.

Yours very truly,

(*Name on Request*)

Dist. Superintendent of Plant.



Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision Over Telephone Companies—Decisions of Courts in Matters of Interest to Public Utilities and Actions of City Councils Relative to Franchise, Rates and Service

Indiana Bell Telephone Rate Case Settled Out of Court.

The Indiana Bell Telephone Co. and state officials of Indiana who have been at loggerheads over the proposed increase in telephone rates, have made mutual concessions and settled their disagreements out of court. Credit for the settlement is due to Judge George T. Page, of the federal circuit, for the suggestion that resulted in the dismissal of both federal and state court actions.

Under the terms of the compromise, the Indiana Bell company agrees to revert to the rates prior to July 1. On the latter date it had put into effect rate increases that it figured would increase its total revenue $385,000 a year, but which state officials contend would be more nearly $1,000,000.

Peace in the telephone fight in the Hoosier state, even though it may not be permanently ended, writes finis to a controversy that has waged hot since June, 1923. At that time the first advance in rates sought by the Indiana Bell would have resulted in a gain of approximately $2,000,000 annually. Only $1,000,000 of this increase was allowed by the utilities commission.

The company obtained a restraining order that permitted a charge of $600,000 over the commission's allowance. The federal court made this restraining order permanent June 23 of this year. Then followed the effort to change to the meter system, whch has just been ended by compromise. The inquiry into the telephone company's affairs, on which will hinge further rate changes, will be ordered immediately, according to Samuel R. Artman, chairman of the Indiana Public Utilities Commission.

Company Testimony in New Jersey Case Practically Concluded.

The presentation of testimony in support of its application for new rates was practically concluded July 9 by the New York Telephone Co. before the New Jersey Public Utility Commission when T. P. Sylvan of Montclair, N. J., a vice-president of the company, testified. Mr. Sylvan told of the benefits accruing to the New York company through its contractual relations with the American Telephone & Telegraph Co., the parent organization of the Bell telephone system, and with the Western Electric Co.

While Mr. Sylvan declared it was almost impossible to evaluate exactly the services rendered the New York company by the American company, he showed that the existing arrangements between the two companies resulted in a saving to the New York company far in excess of the amount paid for such service. On the other hand, the arrangements between the New York company and the Western Electric Co., Mr. Sylvan said, resulted in a saving of at least 15 per cent in the cost of materials furnished by the Western Electric Co.

He gave as his opinion as an executive of the New York company that the contract with the American company and the resultant Western Electric contract were of extreme value, and that the services rendered by the American company were worth far in excess of the amount paid for them.

H. R. Gabay, general commercial engineer for the New York Telephone Co., W. A. Keitzman, general commercial engineer for the Delaware & Atlantic Telephone & Telegraph Co., explained in detail the proposed rate schedule for North and South Jersey.

Rate Increase Approved for Richmond (Ind.) Home Company.

Increased telephone rates for the Richmond Home Telephone Co. of Richmond, Ind., were authorized in an order of the Indiana Public Service Commission issued July 1.

The commission placed a valuation of $950,000 on the property of the company for rate-making purposes. The new rates, the order said, will yield a return of about 7 per cent on the valuation. The company had asked for higher rates than those approved by the commission.

The new schedule of monthly rates follows: Business. unlimited service, $4.75; two-party, $3.75; four-party, $3.25; residence, unlimited, $2.40; two-party, $2.15; four-party, $1.90.

Seeks to Enforce Franchise Rates of Predecessor Company.

City Attorney Joe Whitney, of Storm Lake, Iowa, has filed a petition for an injunction restraining the Northwestern Bell Telephone Co. from placing in effect rates in excess of those specified in the franchise granted to its predecessor, the Northern Telephone Co., in 1902. Hearing on the petition has been set for Monday, July 21.

The city bases its case upon the revised ordinances passed July 31, 1902, which state that "the maximum rate to be charged is not to exceed $2 per month for business telephones, and $1 per month for residence telephones, giving both day and night service."

In the petition for injunction, Attorney Whitney declares that the Northwestern Bell Co. is successor to the Northern Telephone Co., which in 1902 made application for a franchise. The present company, he claims, has no rights independent of or acquired in any way or manner other than its succession to the right of the Northern Telephone Co.

He asserts that the new rate is "grossly in excess" of the contract rates provided for by the ordinance quoted and is a violation of the contract or franchise granted in 1902 for 25 years.

The company claims that through the purchase of the plant, it is operating under a state law and not under the ordinance upon which the city bases its case. It furthermore claims that it has a perpetual franchise. The company asserts that it cannot do business at a loss and that the courts have held that it cannot be compelled to continue to operate its lines without a reasonable profit.

New Jersey Proposed Rate Increases Again Suspended.

Further suspension of the proposed schedule of increased rates by the New York Telephone Co. and the Delaware & Atlantic Telegraph & Telephone Co. for its exchanges in the state of New Jersey. has been ordered by the New Jersey Public Utilities Commission for three months, dating from July 1.

Testimony in Fort Worth Telephone Rate Injunction Case.

Hearings on the petition of the Southwestern Bell Telephone Co. before Master in Chancery C. L. McCartney, restraining the city of Fort Worth, Texas, from enforcing the ordinance rates of that city and interfering with the company's action in placing in effect rates in excess of the ordinance rates which it contends are confiscatory, were continued on June 27.

Actual or "book cost" of the physical property of the Southwestern Bell in Fort Worth is close to $3,650,000, plus $100,000 working capital and $56,000 in office furniture, garage, vehicles and other minor items, A. E. Scott, statistician for the company, testified under cross-examination by counsel for the city. The local

plant is valued by the company in excess of $5,000,000, according to statements made during the hearing.

The amount of money in the depreciation reserve of the Southwestern company in 1920, when the Texas company was taken over by it was about $5,781,000, Mr. Scott stated. The present reserve for depreciation is about $28,000,000.

The amount of money taken out of gross receipts and placed in this reserve is left entirely to the judgment of the officials of the firm by the Interstate Commerce Commission, Mr. Scott stated. However it is indirectly based on the cost of the property of the firm.

The yearly amount which should justly be taken out of the gross earnings of this plant and placed in the depreciation reserve is $243,000, it was stated by Mr. Scott.

The expense allotted for depreciation, said the master in chancery, was the "storm center of the controversy," and that the $250,000 set aside for this purpose should be thoroughly gone into.

Attempts to Tax On Company's Rate Valuation.

Representatives of the Northwestern Bell Telephone Co. staged a warm and finally successful fight to prevent the adoption by the taxing authorities of Nebraska of the ten million dollars' worth of valuation of the property located in Douglas county that was claimed for it in the federal court rate case. The company had returned the value as $4,058,000. The board of equalization was intent upon requiring the company to pay taxes on the same basis as the company figured rates, but after a long argument backed up on the proposition.

Vice-President Pratt defended the ten-million valuation. He said that it represented what the company had put into the property, but that there had been a two-million-dollar depreciation since that time. He pointed out that "stinging" the company for more taxes would not benefit anybody, and that in the end the subscribers would have to foot the bill. He added that the courts have definitely held that Douglas county property is being assessed at 60 per cent of its actual value, and with the depreciation deducted the company's return was fair.

Mr. Pratt said that from the revenue the company receives in Omaha from each subscriber each year, $6 goes for taxes, and in five years the company has not earned 4 per cent on its investment there. One reason he said was that the city has put some ten million dollars of public utility plants—those it owns itself—on the free list and loaded the expense on other property owners.

He also said that there could be no force in the argument that the company is asking returns on full valuation and ought to pay taxes on that basis in the face of the fact that the company is not getting more than half the return to which it is entitled. The board finally fixed the valuation at $4,500,000.

THE INDEX FOR VOLUME 86 OF "TELEPHONY."

The index for Volume 86 of "Telephony," which was completed with the issue of June 28 is now ready for distribution among those who keep complete files.

In this index are listed all of the important articles which have appeared in the weekly issues of "Telephony" from January 5 to June 28. It will be supplied free of charge to those making application.

City Made Codefendant in Dallas Telephone Rate Case.

The city of Dallas will be made a codefendant in the case of W. S. Bramlett vs. the Dallas Telephone Co. on order of Judge Royall R. Watkins of the 95th district court after the hearing, June 28, on a general demurrer filed by the telephone company in answer to Mr. Bramlett's petition for an injunction restraining the company from charging the present rates for service.

The petition for a permanent injunction was filed by Mr. Bramlett last September, in which it was alleged that the present rates of $9 a month for business telephones and $4 a month for residence telephones, in addition to all other rates charged, are too high. Mr. Bramlett alleges that $3 a month would be an adequate charge for individual single line service with desk sets and $2.75 a month for individual single line service with wall sets.

Other questions of law raised in the telephone company's demurrer were overruled, although the issue that the plaintiff can not file suit against the telephone company without including the city of Dallas was sustained. Mr. Bramlett was granted leave to file an amendment to the injunction petition making the city a party.

The hearing on June 28 was on the motion to dissolve the temporary writ already granted to Mr. Bramlett restraining the telephone company from charging him the current telephone rates. Mr. Bramlett represented himself, the plaintiff, and C. C. English represented the Dallas Telephone Co.

Summary of Commission Rulings and Schedule of Hearings.

INTERSTATE COMMERCE COMMISSION,
WASHINGTON, D. C.

June 28: The commission approved the acquisition by the Petroleum Telephone Co., of Oil City, Pa., of certain properties of the Bell Telephone Co. of Pennsylvania and the acquisition by the Bell of certain properties of the Petroleum company.

BONITA
Aerial
CABLE
RINGS
(PATENTED)

are made in eight sizes which can be supplied to fit *any* diameter of supporting strand or messenger.

More than 80,000,000 of these rings are now in the service of telephone, telegraph and power companies as well as industrial corporations and railroads.

Send for
Free Sample Set

CAMERON
APPLIANCE CO.
Everett, Mass.

The commission found that the Bell company had agreed to sell to the Petroleum company all lines now owned by it and used for connecting the premises of its customers with its exchanges in Franklin, Titusville, and Oil City, and also certain toll wires between Titusville and Pleasantville; that the Bell company's switchboards at the three points named were not included in the proposed transfer; that the switchboard at Oil City was to be maintained for toll service, and that the Petroleum company's system was to be connected therewith with trunk lines, the other two switchboards to be withdrawn from service.

It found, further, that the price to be paid by the Petroleum company for the properties it proposed to purchase was $190,000; that the Petroleum company proposed to sell to the Bell company toll lines extending from Titusville to Corry and from Franklin to Sandy Lake for a consideration of $32,354, the difference between the prices of the properties to be transferred to be paid to the Bell company by the Petroleum company in cash; that the proposed acquisition would eliminate existing duplication and apparently should result in improved service.

California.

July 9: Southwestern Home Telephone Co., operating in the counties of San Bernardino, Riverside and San Diego, applied for authority to execute a mortgage and to issue $340,000 of its series "A" bonds for the purpose of refunding outstanding first mortgage bonds and to refinance outstanding indebtedness.

July 11: In complaint of V. V. Tubbs against Pacific Telephone & Telegraph Co. regarding boundary line between the Santa Ana and Tustin exchange areas, complaint found reasonable and company ordered to relocate its exchange boundary lines.

Illinois.

June 17: Order dismissing complaint of the Commercial Telephone & Telegraph Co. vs. the Sexton Mfg. Co., of Fairfield, for failure to furnish telephone service to the Sexton Mfg. Co. through telephone lines and switchboard equipment installed in its office in Fairfield. No. 13919.

June 17: Order approving agreement between the La Harpe Telephone Co. and the Blandinsville Switchboard Co., dated June 1, 1923, for the purchase by the Blandinsville Switchboard Co. and sale by the La Harpe Telephone Co. of certain toll property, described in agreement, under conditions set forth in order. No. 13714.

June 17: Order approving supplemental agreement, dated April 1, 1924, between the Illinois Bell Telephone Co. and the Northern Illinois Telephone Co., cancelling agreement approved by second supplemental order and providing for removal of local service restriction from a circuit owned by the Northern Illinois Telephone Co. between Sandwich and Sheridan. No. 10255, 3rd Sup.

June 17: Order dismissing citation order issued by the commission, dated December 14, 1922, requiring the Mendon Telephone Co. and the Telephone Exchange of Loraine to appear and show cause why telephone communication cannot be established between their respective exchanges. No. 12875.

June 17: Order approving intercorporate agreement, dated April 24, 1924, between the Mendon Telephone Co. and the Telephone Exchange of Loraine, providing for the connection of the toll lines of the Mendon Telephone Co. to the lines of the Loraine exchange at Charles F. Clair's corner, between Loraine and Mendon. TA-63.

June 17: Order approving supplemental agreement, dated August 1, 1923, between the Central Telephone & Telegraph Co. and the Illinois Bell Telephone Co. which excludes from use two copper metallic circuits and one phantom circuit between Paxton and Loda, making the delivery point for business handled over Bell lines at Paxton instead of at Loda. No. 10353 1st Sup.

June 17: Order permanently cancelling and striking from the files Rate Schedule Ill. C. C. 2 of the National Telephone & Telegraph Co.; also, dismissing application of company for permission to advance telephone rates. No. 13506.

June 17: Order suspending until October 29, 1924, proposed rates for telephone service in Greenview, stated in Rate Schedule Ill. C. C. 2, first revised sheet 1 of the Menard Telephone Co. No. 14207.

June 17: Order suspending until October 29, 1924, proposed rates for telephone service in Elliott and vicinity, stated in Rate Schedule Ill. C. C. 2 of the Dix Telephone Co. No. 14208.

June 17: Order authorizing the Washington Home Telephone Co. to issue and sell $5,000 aggregate principal amount of its first mortgage gold bonds, dated January 1, 1924, maturing serially until January 1, 1934, bearing interest at rate of 6½ per cent semi-annually, bonds to be issued so as to net company not less than 92½ per cent of their face value, under conditions set forth in order. No. 14145.

June 24: Order dismissing complaint of Norman L. Howard, manager, Tyas Garage, for alleged discrimination in the application of charge for extension bells in Greenfield, Greene county, and directing the Illinois Telephone Co. to discontinue application of service connection charge in cases where telephones have been disconnected for non-payment of bills and later reconnected, and that company refund to Norman L. Howard the amount of $3.50 so collected; also directing company to furnish telephone service to Edward H. Trabue upon application. No. 13966.

July 15: Hearing at Springfield in re proposed advance in rates of Marissa Telephone Co. for telephone service in Marissa, St. Clair county. No. 13972.

July 16: Hearing at Springfield in re application of the Astoria Telephone Co., B. B. Boynton, attorney, and H. S. Bucher for approval of purchase by the Astoria Telephone Co. and sale by H. S. Bucher of the telephone property of the Astoria Telephone Co. in the village of Astoria, for the sum of $14,000; also for a certificate of convenience and necessity to the Astoria Telephone Co.; also for authority to issue $25,000 par value of capital stock. No. 14200.

Indiana.

July 1: The commission authorized the Richmond Home Telephone Co., of Richmond, to increase its rates for telephone service.

July 3: The commission granted authority to the Northwestern Indiana Telephone Co. to put in effect August 1 increased rates at Valparaiso, Kouts, Chesterton, Hobart and Wheeler. These rates are to remain in effect for two years when the present rates shall become effective again, unless otherwise ordered by the commission. The company was directed to file semi-annually a detailed statement of expenditures in rebuilding its system.

July 14: Hearing before Chairman John W. McCardle on the petition of the Citizens Independent Telephone Co., of Terre Haute, and the Indiana Bell Telephone Co. for approval of the purchase and sale of certain toll lines in Vigo county.

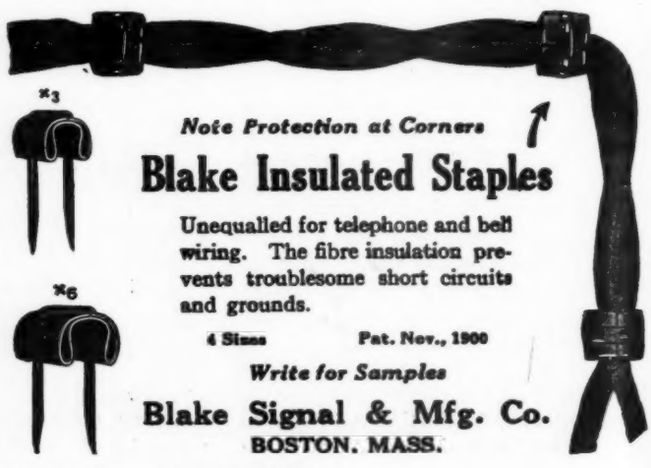
Kansas.

June 18: The commission authorized the Delphos Telephone Co., of Delphos, to issue common stock in the amount of $8,750 and 7 per cent preferred cumulative stock in the amount of $11,375, making a total issue of $20,125, the stock to be sold for cash at par, or where possible to do so, shares may be exchanged dollar for dollar for shares of the Rural Telephone Association of Delphos. The proceeds from the sale of stock are to be used first for the payment of $16,350, the purchase price to be paid for all of the property heretofore owned by the Rural Telephone Association of Delphos, and, second, $3,775 of such proceeds is to be used for the purpose of making additions and betterments to the property and for working capital. No. 6496.

North

The North Line offers every kind of automatic telephone service, including the Automanual System for local and toll service, Automanual Remote Control of small exchanges and Dial Automatic for both private exchanges and central office equipment.

The North Electric Manufacturing Company
Galion, Ohio
Manufacturers of Telephone Equipment Since 1884



Note Protection at Corners

Blake Insulated Staples

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

4 Sizes Pat. Nov., 1900

Write for Samples

Blake Signal & Mfg. Co.
BOSTON, MASS.

Please tell the Advertiser you saw his Advertisement in TELEPHONY.

June 28: The commission approved a $295,000 preferred stock issue by the United Telephone Co. of Abilene. The application for authority states $85,000 of the money derived from the sale of stock will be spent at Salina. Plans call for the expenditure of $50,000 on the Manhattan exchange. A total of $100,000 is to be spent at places not designated.

MINNESOTA.

July 24: Hearing at Baudette on application of the Warroad Telephone Co. for authority to change its business, rural and residence rates within the village of Baudette. M-1375.

July 25: Hearing at Warroad on application of Warroad Telephone Co. to change its rates for business, rural and residence service within the village of Warroad.

MISSOURI.

June 26: The commission authorized the Home Telephone Co., of Joplin, to issue $132,000 face value of its 6 per cent bonds and to issue $50,500 of preferred stock, the bonds to be sold at not less than 90 per cent of their face value plus accrued interest, and the stock to be sold at par, the proceeds arising from the sale thereof to be used in payment of liabilities incurred in the making of extensions and additions to applicant's plant. No. 3997.

July 15: Hearing at Farmington in re application of the Lead Belt Telephone Co. for permission to increase its rates in that city.

NEBRASKA.

July 10: Complaint filed by F. B. Sebring, of Blue Springs, against Gage County Telephone Co., involving reconstruction of farm lines.

July 11: Application of the Northwestern Bell Telephone Co. for authority to increase rates at Belmont and Whitney exchanges, denied in part; granted in part. Ordered that company be authorized to charge subscribers for both exchanges hereafter the rate charged at Crawford, the three towns to constitute a free service zone.

July 11: In the matter of the application of the Byron Telephone Co. for increase in rates; various patrons appeared and entered objections to the proposed rates, but admitted that company is entitled to more revenues than the present flat rates of $1 a month provide; case taken under advisement.

July 11: Hearing held at Superior on application of the Hardy Telephone Co. for authority to increase rates; patrons appeared in resistance to rates unless assured that they are given an added exchange service with the Nuckolls County Independent Telephone Co., which the latter is reluctant to offer; taken under advisement.

NEW JERSEY.

July 1: The commission ordered a further suspension of three months in the rate increases proposed by the New York Telephone Co. and the Delaware & Atlantic Telephone Co. from this date.

NEW YORK.

July 10: Agreement having been made between the Ouleout Valley Telephone Co., of Franklin, Delaware county, and the Otsego & Delaware Telephone Co. over the question of toll service furnished by the latter to the former, the commission amended its order of February 20, approving another plan by which the Otsego company will be guaranteed payment of charges.

July 10: Complaint of the city of Cohoes against the New York Telephone Co. over the matter of toll rates between Cohoes and Albany closed on the records

ORANGEBURG FIBRE CONDUIT

In use for thirty years

AFTER using Orangeburg Fibre Conduit for a generation, hundreds of public utilities testify to these two facts:

1. That fibre conduit is the safest and most reliable form of underground duct line construction.

2. That Orangeburg Fibre Conduit represents the high quality of product you would expect from a company combining thirty years' experience with the most complete manufacturing facilities.

You can always depend on Orangeburg Fibre Conduit as a permanent and reliable installation.

JOHNS-MANVILLE Inc., 292 Madison Ave. at 41st St., N. Y. C.
Branches in 62 Large Cities
For Canada: CANADIAN JOHNS-MANVILLE CO., Ltd., Toronto

THE FIBRE CONDUIT CO. REG. U.S. PAT. ORANGEBURG ORANGE

JOHNS-MANVILLE SERVICE COVERS THE CONTINENT

Through— Electrical Materials FOR Utilities Jobber Contractor AND Dealer

JOHNS-MANVILLE

SOLE SELLING AGENT

Valuations—Supervision—Plant—Inductive Interference
Expert Administrative Counsel for Utilities
JAY G. MITCHELL
TELEPHONE ENGINEER
Member A. I. E. E.
1042 W. Monroe St. Springfield, Ill.

Frank F. Fowle & Co.
Electrical and Mechanical
ENGINEERS
Monadnock Building CHICAGO

CONSULTING
Telephone Engineer
GARRISON BABCOCK
809—20 East Jackson Blvd., Chicago, Ill.
Telephone Wabash 5212

THE BOWDLE SYSTEM
Always shows you where you stand.
We have solved the bookkeeping problem of a large number of companies.
Write us about our monthly audit.
Bowdle Accounting System
Cerro Gordo, Illinois

W. C. POLK
CONSULTING TELEPHONE ENGINEER
Plans, Estimates and Reports,
Appraisal and Supervision
Can arrange a moderate amount of financing.
Telephone Bldg. Kansas City, Mo.

W. H. CRUMB
Telephone Engineer
9 South Clinton St. Chicago

TELEPHONE ACCOUNTING
"COFFEY SYSTEM"
The Independent Standard
Coffey System and Audit Co., C. P. A.
807 Peoples Bank Bldg., Indianapolis, Ind.
Exclusive Telephone Accountants

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization, and Operation of Telephone Companies.
J. G. Wray, Fellow A. I. E. E.
Cyrus G. Hill
1947 First National Bank Bldg., Chicago

of the commission without prejudice to the right of the city of Cohoes to reopen the case at any time on the record already before the commission. No new evidence was submitted before Commissioner Van Voorhis on July 10, the matter being held up pending a determination of the whole question of New York Telephone Co. rates. M. James Conboy, corporation counsel of Cohoes, appeared for the city, and Paul H. Burns of New York for the New York Telephone Co.

July 11: The Granville Telephone Co., of Granville, filed a new tariff, revising certain of its present schedules. The changes are to become effective August 1. Seven of the company's exchanges are in New York state and four in Vermont, but three of the Vermont exchanges supply service to some localities in New York state.

The new schedules propose to discontinue the North Granville, N. Y., exchange and transfer the localities now served from there to the Granville exchange.

July 24: Hearing at Albany on the petition of the Cummings Telephone Corp., of New Woodstock, Madison county, for permission to construct telephone lines in certain towns of Onondaga and Madison counties. For several years Ervin E. Cummings, under the name of Cummings Telephone Co., has operated telephone lines in the towns of Pompey and Fabius, Onondaga county, and Nelson, Cazenovia, De Ruyter and Georgetown, Madison county, and including the unincorporated villages of New Woodstock and Delphi Falls, both in the town of Cazenovia. The petitioning corporation has been formed to take over these lines.

OKLAHOMA.

July 3: The commission authorized the Southwestern Bell Telephone Co. to establish a flat rate of $7.50 per month to business houses which have telephones in general public use and desire to give unlimited free service to their patrons. This rate is a compromise of a controversy between the company and Roach & Veazey, druggists of Oklahoma City.

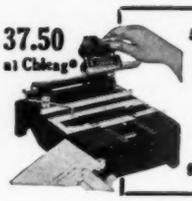
WEST VIRGINIA.

June 30: The Chesapeake & Potomac Telephone Co. filed a schedule of increased toll rates and the commission suspended it pending investigation as to their reasonableness.

WISCONSIN.

July 11: The commission authorized the Osseo Telephone Co., of Osseo, to issue 228 shares of its capital stock of the par value of $50, making a total issue of $11,400. SB-2002.

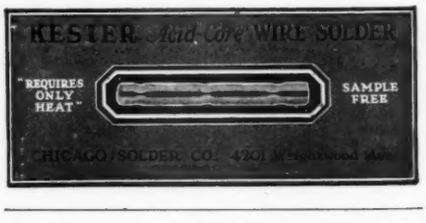
July 11: The commission authorized the Auburndale Telephone Co., of Auburndale, to legalize its rates on file with the commission for its entire system, with which has been merged the property of the Sherry Telephone Co., serving 55 subscribers. The Sherry company, prior to the sale of its property, had a rate of $1.25 per month. The rates of the Auburndale company follow: Single party, business or residence, $3; two-party business, $2.50; two-party residence, $2; business, more than two parties, $2; residence, more than two parties, $1.50 two telephones used by the same party in same building on private line, $4; two telephones used by the same party on the same line where only one telephone can be rung, $3.50; two telephones used by the same party on a private line, one business and the other residence, $4.50; extensions, 50 cents. It is understood that the residence rate for lines with more than two parties is also the rate for rural residence service. U-3024.


37.50 at Chicago
5 Times Faster
"Typewrites" Names, Addresses and rates on bills, 500 to 1000 an hour. FREE TRIAL. Easy Terms.
Addressograph
806 W. Van Buren St. Chicago, Ill.

GUSTAV HIRSCH, M.E.
CONSULTING ENGINEER
COLUMBUS, OHIO
Appraisal Construction Reports

CHAPMAN
LIGHTNING ARRESTERS
Manufactured by
MINNESOTA ELECTRIC CO.
Minneapolis, Minn.

Cedar Poles
Northern White—Western Red
Prompt Shipments Large Assortments
Butt Treatment If Desired
CRAWFORD CEDAR CO.
MENOMINEE, MICHIGAN



GENERALINSULATE CO., Atlantic Ave., Brooklyn, N.Y.
"INSULATE"
Hard Rubber Substitute
Knobs, Insulators, Receiver Cases, Dials, Etc.
Specials of Any Article to Order

POSITIONS WANTED

WANTED—Permanent position by experienced utility bookkeeper, office manager and auditor. College education. Address 5593, care of TELEPHONY.

POSITION WANTED—By September 1st lady manager. 10 years' telephone experience. Wishes exchange 500 to 800 subscribers. Best of references. Address Josephine Howell, Milo, Mo.

POSITION WANTED—As manager of 3,000 station or less telephone plant; or number of plants. Good construction man and collector. Address 6005, care of TELEPHONY.